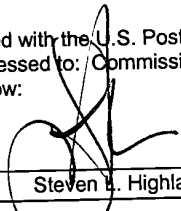




CERTIFICATE OF MAILING 37 C.F.R. §1.8	
I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-01450, on the date below:	
November 3, 2003 Date	 Steven L. Highlander

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

*In re* Application of:  
Sujata KALE and  
Michael W. LONG

Serial No.: 09/753,043

Filed: December 27, 2000

For: PROCESS FOR EX VIVO FORMATION  
OF MAMMALIAN BONE AND USES  
THEREOF

Group Art Unit: 1636

Examiner: Jean C. Witz

Atty. Dkt. No.: UMIC:048US/SLH

**DECLARATION OF MICHAEL LONG UNDER 37 C.F.R. § 1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-01450

Dear Sir:

1. I am a citizen of the United States of America, residing at 570 High St., Northville MI 48167.

2. I am the Michael W. Long named as an inventor on the above-captioned patent application. I have been conducting research in the area of bone formation and repair for 18 years. A copy of my *curriculum vitae* is attached.

3. Based on a review of the Office Action mailed on April 4, 2003, it is my understanding that the examiner for above-captioned application has suggested that the bone “nodules” or “globules” described in U.S. Patent 6,152,964 are the same as the bone spheroids of the instant application. However, I believe the examiner to be incorrect in this supposition. The following paragraphs set forth facts that support my position.

4. First, the ‘964 patent requires that the cells be grown on a substrate (Summary; column 2, line 51). The tissue-like aggregates that we grow (referred to as bone cell spheroids) do not require a substrate. Rather, the cells are induced to grow as tissue-like aggregates without a need for structural support.

5. Second, there is a considerable difference in the size of bone cell spheroids and what the ‘964 nodules. FIGS. 1 and 4 in the ‘964 patent are SEM photos. Thus, the material they are describing is, by definition, sub-microscopic. The bone cell spheroids we develop as part of this invention consist of 10,000 to 100,000+ cells. They are thus much larger in size. Likewise the bone synthesized by the cells of the spheroid is larger than the structures apparent in FIGS. 1 and 4 of the ‘964 patent.

6. Third, the ‘964 patent clearly states that ascorbic acid,  $\beta$ -glycerol phosphate, and dexamethasone are “essential for the production of bone-like tissue” (column 4, line 27). These substances are not required for the production of bone cell spheroids, nor are they required for the formation of bone by these cells.

7. Fourth, the ‘964 patent uses undifferentiated bone marrow cells (Summary; column 2, lines 40, 51, 61; column 4, line 21; Claims), and in particular stromal cells (column 2, line 48). The present application specifically uses differentiated bone cells (both preosteoblasts

and osteoblasts). These are specifically isolated from bone fragments in which the bone marrow cells are washed away, and further removed by collagenase treatment.

8. Based on the points set forth above, I believe that it is quite clear that the bone nodules of the '964 patent are distinct from the bone cell spheroids of the present application.

9. I hereby declare that all statements made herein of my knowledge are true and that all statements made herein on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under § 1001 of Title 18 of the U.S. Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date

10/31/05

Michael W. Long, Ph.D.

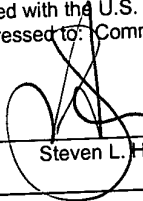
Michael W. Long, Ph.D.



CERTIFICATE OF MAILING  
37 C.F.R. §1.8

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, Washington, DC 20231, on the date below:

November 3, 2003  
Date

  
Steven L. Highlander

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

*In re* Application of:  
Sujata KALE and  
Michael W. LONG

Serial No.: 09/753,043

Filed: December 27, 2000

For: PROCESS FOR EX VIVO FORMATION  
OF MAMMALIAN BONE AND USES  
THEREOF

Group Art Unit: 1636

Examiner: Jean C. Witz

Atty. Dkt. No.: UMIC:048US/SLH

**DECLARATION OF JULIE GLOWACKI UNDER 37 C.F.R. §1.132**

Hon. Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

1. I am a citizen of the United States of America, residing at 76 Perkins St., Jamaica Plain, Massachusetts.

2. I currently hold the position of Professor of Orthopedic Surgery, Harvard Medical School, and Professor of Oral and Maxillofacial Surgery, Harvard School of Dental Medicine,

Boston, Massachusetts. I have been conducting research in the areas of skeletal physiology, pathophysiology and repair for 30 years. A copy of my *curriculum vitae* is attached.

3. I am a compensated member of the Scientific Advisory Board for the licensee of the above-captioned application, Velcura Therapeutics.

4. I have received the application and pending claims for the above-captioned application of Long and Kale, as well as that portion of the Office Action mailed on April 4, 2003 that deals with U.S. Patent 6,152,964. From these items, it is my understanding that the examiner for above-captioned application has suggested that the bone "nodules" or "globules" described in U.S. Patent 6,152,964 are the same as the bone spheroids of the instant application. However, I believe the examiner to be incorrect in this supposition. The following paragraphs set forth facts that support my position.

5. First, the '964 patent requires use of undifferentiated marrow cells, which are very different from the differentiated cells defined in the instant application at page 13. Second, the '964 patent requires ascorbic acid and dexamethasone to induce formation of macroscopic nodules, whereas the instant application does not require such for the formation of bone spheroids. Third, the '964 patent requires a substrate, upon which nodules are formed and with which the nodules are co-implanted, whereas the instant application does not require a support for bone spheroids. And fourth, the '964 patent does not utilize "serum free" conditions to achieve formation of spheroids by bone precursor cells.

6. I hereby declare that all statements made herein of my knowledge are true and that all statements made herein on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under § 1001 of Title 18 of the U.S. Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Oct 14, 2013  
Date

Julie Glowacki  
Julie Glowacki, Ph.D.

# CURRICULUM VITAE

## PART I: General Information

**DATE PREPARED:** September, 2003

**Name:** Julie Glowacki

**Citizenship:** USA

**Office Addresses:** Orthopedic Research  
Brigham and Women's Hospital  
75 Francis Street  
Boston, MA 02115  
617-732-6855

**E:Mail:** jglowacki@rics.bwh.harvard.edu

**FAX:** 617-732-6937

**Home Address:** 76 Perkins Street  
Jamaica Plain, MA 02130

**Place of Birth:** Boston, MA

### Education:

1966	B.A.	Biology & Chemistry, Boston University (cum laude)
1973	Ph.D.	Biological Chemistry, Harvard University

### Postdoctoral Training:

1972-1974	Research Fellow in Medicine, Endocrine Unit, Massachusetts General Hospital and Harvard Medical School
-----------	---

### Academic Appointments:

1974-1976	Associate in Medicine, Harvard Medical School
1975-1976	Research Fellow in Surgery, Harvard Medical School
1975-1978	Associate in Biological Chemistry, Harvard Medical School
1977-1982	Research Associate, Department of Surgery, Harvard Medical School
1982-1988	Assistant Professor, Department of Surgery, Harvard Medical School
1983-1987	Associate Research Biologist, Department of Medicine, University of California at San Diego (Concurrent Appointment)
1989-2002	Associate Professor, Department of Orthopedic Surgery, Harvard Medical School
1995-2002	Associate Professor, Department of Oral and Maxillofacial Surgery, Harvard School of Dental Medicine

- 1998-2002 Program Director, Oral and Maxillofacial Surgery Foundation Student Research Training Award, Harvard School of Dental Medicine
- 2003 Professor of Orthopedic Surgery, Harvard Medical School
- 2003 Professor of Oral and Maxillofacial Surgery, Harvard School of Dental Medicine

#### **Hospital Appointments:**

- 1974-1976 Associate in Medicine (Endocrine), Massachusetts General Hospital, Boston, MA
- 1975-1976 Research Fellow in Plastic Surgery, Peter Bent Brigham Hospital, Boston, MA
- 1975-1977 Senior Scientist and Administrative Director, Bay Biochemical Research, Boston, MA
- 1976-1977 Assistant in Biochemistry, Endocrine Unit, Massachusetts General Hospital, Boston, MA
- 1977-1988 Director, Demineralized Bone Bank, Children's Hospital, Boston, MA
- 1977-1988 Research Associate in Surgery, Children's Hospital, Boston, MA
- 1982-1987 Research Biologist, Scripps Institute of Oceanography, La Jolla, CA (Concurrent Appointment)
- 1982-1987 Research Biologist, Veteran's Administration Medical Center, La Jolla, CA (Concurrent Appointment)
- 1988- Senior Investigator, Department of Orthopedic Surgery, Brigham and Women's Hospital, Boston, MA
- 1995-2000 Director, Skeletal Biology Research Center, Massachusetts General Hospital, Boston, MA
- 1995-2002 Biologist, Oral and Maxillofacial Surgery Service, Massachusetts General Hospital
- 1996- Director, Skeletal Biology, Department of Orthopedic Surgery, Brigham and Women's Hospital, Boston, MA
- 2002- Affiliate Biologist, Oral and Maxillofacial Surgery Service, Massachusetts General Hospital

#### **Other Professional Positions and Major Visiting Appointments:**

- 1976-1977 Visiting Scientist, University of Mexico and Instituto Nacional de Nutricion, Mexico City, Mexico
- 1982-1983 Visiting Investigator, Salk Institute, La Jolla, CA

#### **Major Administrative Responsibilities:**

- 1995-2000 Director, Skeletal Biology Research Center, Massachusetts General Hospital, Boston, MA
- 1996- Director, Skeletal Biology, Department of Orthopedic Surgery, Brigham and Women's Hospital, Boston, MA

#### **Major Local Committee Assignments:**



**Harvard University:**

2001-2002 Standing Committee on Higher Degrees in Dental Medicine

**Medical School/School of Dental Medicine:**

1986-1988 Faculty Member, Fuller Albright Society  
1994- Research Committee, Harvard Combined Orthopedic Program  
1996-2001 Harvard School of Dental Medicine, Research Committee  
1997-1999 Harvard School of Dental Medicine, Predoctoral Research Committee  
1998- Harvard Combined Orthopedic Residency Core Curriculum Committee  
1998- Harvard Combined Orthopedic Residency Selection Committee  
1998- Alumni/ae Working Group, Harvard Division of Medical Sciences  
1999 Harvard School of Dental Medicine, Search Committee, Department of Growth and Development  
1999-2002 Organizer, Division of Medical Sciences Symposia, HMS Graduation/Reunion Week

**Brigham and Women's Hospital Major Committee Assignments:**

1991-1993 Committee on Research on Women's Health, Brigham and Women's Hospital  
1996-2001 Brigham and Women's Hospital Research Council  
1999- BWH Advisory Committee to the Office of Women's Careers  
2000- Women's Health Leadership Forum  
2003- BWH Research Service Improvement Committee  
2002- Faculty Advisor, Research Fellows' Poster Days

**Massachusetts General Hospital Major Committee Assignments:**

1996-1999 Massachusetts General Hospital Research Council

**National and Regional Major Committee Assignments:**

1986-1990 NIH Study Section Permanent Member, Oral Biology and Medicine Committee 2  
1989-1995 US Army, Intramural and Extramural Consultant  
1989-1995 Science/Technology Committee, American Association of Tissue Banks  
1991-1992 Chairman, Peer Review Panel to the U.S. Army Medical Research and Development Command  
1991 Convener, Session-In-Depth on "Fish and Amphibia", World Congress on Cell and Tissue Culture, June 19, 1991, Anaheim, CA  
1991-1994 US FDA Dental Products Panel, Full Member  
1993-1994 American Red Cross, Committee on New Tissue Services Development  
1994 Organizing Committee, "Bone Morphogenetic Proteins: An International Conference in Honor of Marshall Urist," June 8, 1994, Baltimore, MD.  
1994-present American Red Cross, National Advisory Committee  
1994-1995 Medical Research Council of Canada, Permanent Member, Experimental Medicine Review Committee  
1995 New Investigator Research Awards Committee, Orthopedic Research Society  
1995-1999 Orthopedic Research and Education Foundation, Research Grants Committee  
1995-1999 NIH Study Section Permanent Member, Arthritis, Musculoskeletal, and Skin Diseases Special Grants, AR003  
1995-1996 Chairman, Awards Committee, American Association of Tissue Banks  
1997 Co-Chair, NIH Workshop on Bone and the Immune and Hematopoietic Systems  
1997 Chair, Bone Biology Panel, NASA Life Sciences Research  
1994-2004 Appointments as Intermittent Consultant, US FDA  
1998 Reviewer, Advanced Technology Program, NIST, US Dept of Commerce.

1999-2003	External Advisory Committee, Univ of Iowa Comprehensive Oral Health Research Center of Discovery
2000	Co-Organizer, First Scientific Workshop on Temporomandibular Joint Diseases, TMJ Association, Bethesda, MD
2001	Organizing Committee, Bone Allograft Forum, Amer Assoc Tissue Banks, Washington, DC
Mar 12, 2002	Missouri Life Science Research Capacity Contracts
Apr 20, 2002	Review Panel, General Biomedical Sciences, California Tobacco-Related Disease Research Program (TRDRP)
Mar 13, 2003	Chair and Co-Organizer, Symposium on Repair and Regeneration of Oral and Craniofacial Tissues, Annual meeting of the Amer Assoc Dental Research
May 22, 2003	US FDA Panelist, Dental Products
2003	Toxicological Profile on Fluorides, US Agency for Toxic Substances and Disease Registry, Environmental Protection Agency

#### **External Advisory Boards**

1999-	Dental Center of Excellence, University of Iowa, Iowa City, IA
2003-	University of Connecticut Exploratory Center for Frontier Medicine, Farmington, CT

#### **Memberships, Offices, and Committee Assignments in Professional Societies:**

1977-1987	Plastic Surgery Research Council
1978-	American Society for Bone and Mineral Research
1980-1984	Society for Experimental Biology and Medicine
1981-1995	American Association of Tissue Banks
1981-1985	American Elasmobranch Society
1985-1991	American Society for Cell Biology
1988-	Endocrine Society
1989-1999	International Association for Dental Research
1989-	ASBMR Reviewer of abstracts
1989-	Orthopedic Research Society
1989-1999	American Association for Dental Research
1989-1991	American Society for Zoologists
1999-2002	Council Member, American Society for Bone and Mineral Research
2001	Delegate, FASEB FY2002 Federal Funding Conference
2002	ASBMR Program Committee: Category Chair
2002	Delegate, FASEB FY2003 Federal Funding Conference
2003	ASBMR Program Committee: Category Chair
2003-2006	Chair, ASBMR Ethics Advisory Committee
2003	Delegate, FASEB FY2004 Federal Funding Conference

#### **Community Service Related to Professional Work:**

1991-1994	US FDA Dental Products Panel, Full Member
1991-1994	Boston University Undergraduate Career Advisory Committee
1991-	Boston University Annual Undergraduate Career Receptions, Biology & Chemistry
1994-1996	Chair, Boston University Undergraduate Career Advisory Committee
1996-2001	Boston University College of Arts and Sciences Alumni/ae Board
2000-	Scientific Advisory Board, TMJ (Temporomandibular Joint Diseases) Association
May 18, 2001	Presentation to 7th and 8th grade Biology class, Ethel Walker School, Simsbury, CT
Nov 12, 2002	Presentation to the Pittsfield Women's Club, Pittsfield, MA

#### **Editorial Boards:**

1986-1993	Editorial board, Journal of Bone and Mineral Research
1989-2000	Editorial board, Calcified Tissue International

2002-

## The International Journal of Oral & Maxillofacial Implants

### Editorial reviewer for:

Am. J. Physiology - Cell Physiology  
Analytical Biochemistry  
Annals of Plastic Surgery  
Arthroscopy  
Biomaterials  
Blood  
Bone  
Bone and Mineral  
Calcified Tissue International  
Cancer Research  
Cell and Tissue Research  
Cells, Tissue, and Organs  
Clinical Orthopedics and Related Research  
Developmental Biology  
Drug Investigations  
Endocrinology  
Experimental Hematology  
The International Journal of Oral & Maxillofacial Implants  
International Journal of Oral and Maxillofacial Surgery  
Journal of Biological Chemistry  
Journal of Biomedical Materials Research  
Journal of Bone and Joint Surgery  
Journal of Bone and Mineral Research  
Journal of Cell Biology  
Journal of Cellular Physiology  
Journal of Clinical Endocrinology and Metabolism  
Journal of Clinical Investigation  
Journal of Dental Research  
Journal of Experimental Zoology  
Journal of Medical Primatology  
Journal of Oral and Maxillofacial Surgery  
Journal of Orthopedic Research  
Kidney International  
Laboratory Investigation  
Metabolic Bone Disease and Related Research  
New England Journal of Medicine  
Peptides  
Plastic and Reconstructive Surgery  
Proceedings of the National Academy of Science  
Proceedings of the Society for Experimental Biology and Medicine  
Scanning Microscopy International  
Science

### National Review Committees:

1986-1990	NIH Study Section Permanent Member, Oral Biology and Medicine Committee 2
March 1989	Ad hoc NIH Study Section Member, AIDS and Related Research Review Group, ARR-5; AHR V-1
July 1991	Ad hoc NIH Study Section, Basic Research on Osteoporosis, RFA: AR 91-02
Oct. 1992	NIH AMS Special Grants Review Committee (SGRC)
March 1993	NIH AMS Special Grants Review Committee (SGRC)
July 1994	NASA, Human and Animal Biology (HAB 1.3)

Nov. 1994	NASA, Microgravity Biotechnology (OLMSA)
April 1995	Ad hoc NIH Study Section
July 1995	NIH SBIR Special Study Section
1995-1999	NIH Study Section Permanent Member, NIAMS Special Grants, AR003
1995-1999	Orthopedic Research and Education Foundation (AAOS) Grant Review Panel
April 1996	NIH Study Section of Temporomandibular Joint Disorders
July 1996	NASA, Bone Biology Peer Review Panel
Dec. 1996	NASA, Advanced Technology Review Panel
July 1997	NASA, Bone Biology Review Panel
Nov 1998	NIH Special Emphasis Panel (004-CCMD SEP)
June 1999	NIH Special Study Section, Biomimetics, NIDCR
2000	NASA, Chairman, Bone Biology Peer Review Panel
Nov 2000	NIH Special Emphasis Review Panel (NIAMS P30)
Feb 2001	NASA, Advanced Technology Review Panel (NRA 00-HEDS-03)
April 2001	NIH Special Emphasis Panel, NIAMS
July 2001	NIH Special Emphasis Panel, Bioengineering Research (ZRG1 SSS M01S)
Aug 2001	NIH Special Review Committee, P01, NIAMS
Jan 2002	Chair, NIH Panel ZAR1 TLB-D J2 1, NIAMS
2002-2007	Orthopedic Research and Education Foundation (AAOS) Grant Review Panel

**Site visits for various Institutes of the National Institutes of Health:**

January, 1985: R01; NIDR  
 March, 1985: SBIRG; NIDR  
 December, 1985: MAC P60; NIAMSD  
 March, 1987: MAC P60; NIAMSD  
 November, 1987: P01; NIDR  
 June, 1988: P01; NIAMSD  
 September, 1988: P01; NIDR, with service as Chairman  
 July, 1990: R01; NIAMSD, Teleconference review  
 July, 1992: R01; NIDR, Teleconference review  
 July, 1992: MAC P60; NIAMSD  
 November, 1992: SBIRG; NIDR, Teleconference review  
 December, 1992: R01; NIDR  
 December, 1992: R01; NIDR, Teleconference review  
 March, 1993: MAMDC P60; NIAMSD  
 December, 1997: GCRC, NIH  
 December, 1998: Bone Biology Core Applications, NIAMSD  
 January, 1999: SEP, P60; NIDCR

**Occasional reviewer for:**

U.S. Veterans Administration  
 U.S. Army  
 Swiss National Science Foundation  
 Canadian Medical Research Council  
 American Institute of Biological Sciences  
 Colorado Tobacco Research Program, General Biomedical Sciences Study Section  
 California Tobacco-Related Disease Research Program

**Participant in Focus Groups, including the following, among others:**

Johnson and Johnson  
 Eli Lilly and Company  
 Lotus Corp.  
 W.L. Gore

Monsanto  
 Upjohn  
 Sandoz  
 AO/ASIF

Genentech, Inc  
 Cetus Corporation  
 American Red Cross  
 AO North America

Mitek  
 Integra

### Attendance at Post-Graduate Courses:

June 8-12, 1992	PCR Methods in Clinical Pathology. Center for Advanced Training in Cell and Molecular Biology, Catholic University of America, Washington, DC
June 28-July 7, 1993	In Situ Hybridization. Center for Advanced Training in Cell and Molecular Biology, Catholic University of America, Washington, DC
June 23-24, 1995	National Expert Witness and Litigation Program, Hyannis, MA
Jan 30-Feb. 2, 1996	Joint Symposium on Clinical Trials Design and Analysis on Periodontics, FDA/NIH/AAP, Bethesda, MD

### Awards and Honors:

1973-1974	NIH Postdoctoral Fellowship
1974	King Trust Fellowship
1992	Boston University Collegium of Distinguished Alumni/ae
1992	Omicron Kappa Upsilon National Dental Honor Society
2000	Glenn Foundation Endocrinology and Aging Award to Fellow for Endocrine Society abstract
2001	George W. Hyatt Memorial Award, The American Association of Tissue Banks

## PART II: Research, Teaching, and Clinical Contributions

### A. Narrative report:

#### 1. Narrative description of research:

Dr. Glowacki's research concerns cellular aspects of skeletal growth, repair, reconstruction, and pathophysiology. Experimental and clinical studies showed the appropriate applications of demineralized bone implants for skeletal reconstruction. Subsequent development of composite implant materials led to the design of a collagen sponge with a layer of demineralized bone powder. When human skin fibroblasts are cultured with that device, they begin to produce cartilage matrix within days. Current efforts concern the identification of the "chondrogenic master gene(s)" with this system. Studies on *in vivo* and *in vitro* chondrogenesis include transplantation of perichondrium and ongoing work on cartilage tissue engineering.

*In vivo* and *in vitro* models of osteoclast differentiation revealed the relationship between osteoclasts and macrophage polykaryons, and the importance of the bone matrix protein osteocalcin as a substrate signal for osteoclast differentiation. Defined cocultures of murine marrow stroma and hematopoietic stem cells revealed the role of, osteocalcin, M-CSF, and other stromal products in osteoclast differentiation. That work led to investigations with cultured human marrow that showed the effects of age and estrogen status on cytokine production and osteoclastogenesis. Current work focuses on effects of aging on human marrow in 3D collagen sponges.

Osteogenesis studies include biological principles underlying bone grafting, regulation of angiogenesis in bone formation, distraction osteogenesis, comparisons of fetal and post-natal bone repair, interactions between osteoblasts and implant materials, comparative skeletal and mineral metabolism in fishes, and the functions of bone extracellular matrix proteins in transgenic cells.

Abiding clinical projects include bone substitute materials, pathophysiology of giant cell lesions, natural history of hemangiomas, etiology and management of cranio-maxillofacial deformities, skeletal aging, and metabolic bone diseases.

## 2. Major Research Interests:

Cell biology of osteoclasts, osteoblasts, and chondroblasts  
Clinical use of demineralized bone in craniomaxillofacial, orthopedic, and periodontal surgery  
Regulation of bone and cartilage formation  
Regulation and mechanisms of bone resorption  
Aging and skeletal biology  
Pathophysiology of metabolic bone disease  
Osseous response to implant materials  
The mast cell as a bone cell  
Comparative skeletal and mineral metabolism  
Biology of distraction osteogenesis  
Skeletal tissue engineering

## B. Funding Information:

### Past:

7/1/76-6/30/79	Human Growth Foundation PI: J. Glowacki <i>Regulation in Endochondral Osteogenesis</i>
6/1/77-5/31/81	NIH PI: Co-PI with E.R. Blout <i>Polypeptide Marine Toxins</i>
10/1/82-9/30/85	NOAA Sea Grant R/MP-28 PI: Co-PI with L.B. Deftos <i>Novel Marine Biologicals in the Treatment of Human Skeletal Disease</i>
10/1/82-9/30/85	Monsanto/Harvard Grant PI: J. Glowacki <i>Demineralized Bone</i>
2/1/84-130/89	NIH R01-AR35166 Y01-05 PI: J.B. Lian <i>Osteocalcin Function in Resorption</i>
5/1/85-4/30/88	NIH P01-HD19767 Y01-03 PI: C.S. Anast, PI role assumed by Dr. Glowacki upon his death. <i>Pathophysiology and Treatment of Osteopetrosis Program Project</i>
7/1/85-6/30/88	NIH RO AR31330 Y01-03 PI: J. Glowacki <i>A Model for Studying Regulation of Bone Resorption</i>
10/1/85-9/30/89	Takeda Chemical Industries, Ltd. PI: J. Glowacki

*Demineralized Bone*

7/1/87-6/30/92	NIH P01-CA 45548 Y01-05 PI: J. Folkman <i>Regulation of Angiogenesis Program Project</i>
7/1/88-6/30/92	NIH R01-AR31330 Y04-08 PI: J. Glowacki <i>A Model for Studying Regulation of Bone Resorption</i>
12/1/88-11/30/93	NIHR01-DE08798 Y01-05 PI: J.S. Greenberger with subcontract to J. Glowacki <i>Role of Marrow Stroma in Osteoclast Differentiation</i>
9/30/90-9/29/93 NIH	RR06672 Y01-03 PI: L. Kaufman with subcontract to J. Glowacki <i>Mechanisms of Bone Growth in Fish Hyperostosis</i>
12/1/94-1/31/98 NIH	R01-DE08798 Y06-08 PI: J. Glowacki with Subcontract to J.S. Greenberger <i>Role of Marrow Stroma in Osteoclast Differentiation</i>
3/1/95-2/28/97	Oral and Maxillofacial Foundation PI: L. Kaban and J. Glowacki <i>Mechanisms of Fetal and Postnatal Bone Repair</i>
9/30/95-3/31/97	NIH R41-DE11617 PI: J. Glowacki <i>Devices for Regeneration of Oral Osseous Tissue</i>
3/1/98-6/30/98	Molecular Geodesics PI: J. Glowacki <i>In Vitro Osteocompatibility of a Geodesic Scaffold</i>
9/1/94-8/31/98	NIH R01-AG12271 Y01-03 PI: J. Glowacki <i>Marrow Biology and Bone Mass: Effects of Age and Hormones</i>
1/1/98-12/31/99	Johnson & Johnson PI: J. Glowacki <i>Effects of Implant Materials on Bone Formation</i>
5/1/98-12/31/99	Nabisco PI: J. Glowacki <i>Effects of Macronutrients on Chondrocyte Metabolism</i>
4/1/94-3/31/00	NIH R01-AR43434-01 PI: L. Gerstenfeld with subcontract to J. Glowacki <i>Transgenic Osteoblasts to Examine ECM Functions</i>
9/30/95-9/29/00	NIH R01-AG13519 PI: J. Glowacki <i>Effects of Age and Hormones on Bone Marrow Biology</i>
7/1/96-6/30/02	AO/ASIF Foundation PI: L. Kaban and J. Glowacki

	<i>Synthes Fellowship Stipend</i>
7/1/97-12/31/01	AO/ASIF and Synthes USA PI: L. Kaban and J. Glowacki <i>Distraction Osteogenesis in the Porcine Mandible</i>
4/1/98-3/31/02	Oral and Maxillofacial Surgery Foundation Program Director: J. Glowacki <i>Dental Student Research Training Award</i>
1/1/99-12/31/01	Merck Medical School Grants Program, US-55 PI: J. Glowacki <i>Effects of Alendronate &amp; Estrogen on Human Bone Marrow Cells</i>
7/1/99-6/30/01	BWH Multidisciplinary Grant PI's: M. LeBoff, J. Wright, J. Glowacki <i>Vitamin D Status and Therapy in Postmenopausal Women with Fractures of the Distal Radius</i>
7/1/98-6/30/02	NIH R01 AR44873 PI: J. Glowacki <i>Mechanisms of Chondroinduction of Human Dermal Fibroblasts</i>
<b>Current:</b>	
9/1/98-8/31/04	Department of Defense PI: M. LeBoff <i>Effects of DHEA on Bone in Young Adults</i>
9/1/98-8/31/04	NIH R01 AR45870 PI: D. Zaleske through 8/01 PI: J. Glowacki beginning 8/01 <i>Tissue Engineering of Growing Joints</i>



## Report of Current Research Activities:

### Project

Mechanisms of Chondroinduction of Human Dermal Fibroblasts  
Tissue Engineering of Growing Joints  
Mechanisms Underlying Age Related Bone Loss:  
    Role of the Bone Marrow Stromal Precursor Cells  
Distraction Osteogenesis in the Porcine Mandible  
Effects of Implant Materials on Bone Formation  
Effects of Macronutrients on Chondrocyte Metabolism  
Role of Angiogenesis in Osteogenesis  
Vitamin D Status and Therapy in Postmenopausal Women  
    with Fractures of the Distal Radius

### Role

Principal Investigator  
Principal Investigator  
Principal Investigator  
  
Co-Investigator  
Principal Investigator  
Principal Investigator  
Principal Investigator  
Co-Principal Investigator

## D. Report of Teaching:

### 1. Local Contributions:

#### a) Brigham and Women's Hospital

Oct 5, 1999 Speaker, How to write an abstract. Workshop sponsored by BWH Research Career Development Committee

Oct 7, 2002 Speaker, How to write an abstract. Workshop sponsored by BWH Research Career Development Committee

Mar 6, 2003 Distinguished Judge, BWH Research Fellows Poster Exhibition.

#### b) Medical School, School of Dental Medicine Courses

1998-present, Course Director: OR 512.23 "Problems in Osseous Reconstruction", a 4-week Advanced Biomedical Sciences Course for 4th-year Harvard Medical and Dental Students

1998-present, Harvard Combined Orthopedic Residency Selection Committee, Harvard Medical School

1998-present, Faculty, Core Curriculum, Harvard Combined Orthopedic Residency Program

April 18, 2002 Clinic and Discussion on Fracture Healing, Human Systems Module II-B

#### c) Graduate Medical Courses:

October 26, 1993, Invited Lecturer, "Comparative skeletal and mineral metabolism" Graduate Department of Physiology (Marine Biology), Boston University, Boston, MA.

September 23, 1998, Invited Lecture for Graduate School Course on Osteoporosis, "Biology and Pathophysiology of the Osteoclast", Graduate Department of Nutrition, University of Maine, Orono, ME.

February 11, 2003. Guest Lecture. ChE 194 Advanced Biomaterials and Tissue Engineering (graduate course), Department of Chemical and Biological Engineering, Tufts University, Medford, MA

**d) Invited teaching presentations, seminars, grand rounds (Local)**

September 12, 1985, Invited Lecturer, American Association of Tissue Banks, Boston, MA.

April 3, 1986, Invited Lecturer, "Bone Grafting Materials", Biogen Research Corporation, Cambridge, MA.

February 4, 1988, "The Cell Biology of Giant Cell Lesions of the Jaw", MGH Cancer Center Grand Rounds, Massachusetts General Hospital, Boston, MA.

February 24, 1988, Guest Lecturer, "Comparative Skeletal and Mineral Metabolism: From Shark to Man", New England Aquarium, Boston, MA.

October 17-21, 1988, Invited Speaker, "Third International Conference on Mineralized Tissues", Chatham, MA.

January 11, 1989, Panelist, "Communicating with the Press", Harvard Medical School, Boston, MA.

September 15, 1993, "Osseous Responses to Implant Materials", Worcester Polytechnic Institute, Worcester, MA.

May 11, 1994, Grand Rounds, "Biology of Bone Grafting", New England Baptist Hospital, Boston, MA.

September 27, 1994, Endocrine Grand Rounds, Boston University Medical Center, Boston, MA.

April 11, 1996, Seminar, "Osteoclast Differentiation", Forsyth Dental Center, Harvard School of Dental Medicine, Boston, MA.

May 11, 1996, Faculty, Dexterity Enhancement Workshop, Longwood Skull Base Program, Boston, MA.

November 6, 1996, New England Baptist Hospital Orthopedic Grand Rounds, "Osteoporosis and Bone Marrow Biology", Boston, MA.

June 3, 1998, Panelist, "What to do after your third postdoc at Harvard?" Harvard Medical School, Boston, MA

June 18, 1999, Invited Seminar, "Mechanisms of Skeletal Aging", Endocrine Unit, Massachusetts General Hospital, Boston, MA.

October 5, 1999, "How to Write an Abstract", sponsored by the BWH Research Career Development Committee, Boston, MA

January 10, 2001, Invited Speaker, "Skeletal Effects of the Adrenopause". Children's Hospital Bone Day, Boston, MA

February 20, 2002, Orthopedic Grand Rounds, "Osseous responses to old and new implant materials", MGH, Boston, MA

October 12, 2002, "How to Write an Abstract", sponsored by the BWH Research Career Development Committee, Boston, MA

**e) Continuing Medical Education courses**

January 8, 1989, Invited Faculty, "The Brookdale Maxi-Course in Oral Implantology", New York, NY.

March 15, 1990, Faculty, "The Second Annual Brookdale Maxi-Course in Oral Implantology", New York, NY.

April 12, 1991, Faculty, "The Third Annual Brookdale Maxi-Course in Oral Implantology", New York, NY.

May 1, 1991, Faculty, PMA Education and Research Institute Program on "Osteoporosis and Bone Metabolism", Boston, MA.

May 10, 1991, Faculty, The Boston Course on "Oral Implantology", Boston, MA.

April 9-11, 1992, Faculty, HMS Total Knee Replacement Course, Cambridge, MA.

May 12, 1992, Faculty, PMA Education and Research Institute Therapeutic Series: "Osteoporosis and Bone Metabolism", Boston, MA.

May 5, 1993, Faculty, PMA Education and Research Institute Therapeutic Series: "Osteoporosis and Bone Metabolism", Boston, MA.

May 4, 1994, Faculty, PMA Education and Research Institute Therapeutic Series: "Osteoporosis and Bone Metabolism", Boston, MA.

September 16, 1994, Invited Faculty, "The Sixth Annual Brookdale Maxi-Course in Oral Implantology", New York, NY.

May 16, 1995, Faculty, PhRMA Education and Research Institute: "Drug Development in Osteoporosis and Bone Metabolism", Boston, MA.

September 15, 1995, Invited Faculty, "The Seventh Annual Brookdale Maxi-Course in Oral Implantology", New York, NY.

May 13, 1996, Faculty, PERI Therapeutic Series: "Drug Development in Osteoporosis and Bone Metabolism", Boston, MA.

October 25, 1996, Faculty, "The Eighth Annual Brookdale Maxi-Course in Oral Implantology", New York, NY.

November 13, 1997, Faculty, "The Ninth Annual Brookdale Maxi-Course in Oral Implantology", New York, NY.

August 22, 1998, Faculty, Distraction Osteogenesis Course, AO/ASIF, Chicago, IL.

October 24, 1998, Faculty, "The Tenth Annual Brookdale Maxi-Course in Oral Implantology", New York, NY.

May 22-23, 1999, Faculty Lecture, "Osteotomy versus Distraction Osteogenesis", AO/ASIF Continuing Education Course on Distraction Osteogenesis, Louisville, KY.

December 18-19, 1999, Faculty Lecture "Growth factors during distraction osteogenesis", Distraction Osteogenesis Course, AO/ASIF, Chicago, IL.

December 18-19, 1999, Faculty Lecture "Effects of latency period and distraction rate on osseous healing and osteogenesis in craniofacial bones", Distraction Osteogenesis Course, AO/ASIF, Chicago, IL.

September 16, 2000, Faculty, "The Twelfth Annual Brookdale Maxi-Course in Oral Implantology", New York, NY.

December 8, 2001, Faculty, "The New York Maxi-Course in Oral Implantology", New York, NY.

October 3, 2003, Lecture "Enhancing Histogenesis for Joint Repair and Construction". Current Progress in Tissue Engineering, HMS Continuing Education, Boston, MA

**f) Advisory and Supervisory Responsibilities in Laboratory Settings**

Graduate Student Advisor  
1-2 graduate student(s) in laboratory/year

Postdoctoral Fellow Advisor  
1-3 postdoctoral fellows in laboratory/year

1979-present	Harvard School of Dental Medicine; Member of Thesis Committees for Undergraduates and Fellows
1980-present	Harvard School of Dental Medicine; Supervisor of Masters and Doctoral Thesis Candidates.
1988, 1993	HMS Combined Orthopedic Residency Program; Thesis Day Discussant
1993	Harvard - MIT HST; Examiner of M.D. Honors Candidates
1994, 1995	Mentor for "Project Success," a program for minority high school student professional development

**g) Leadership Roles in Teaching**

1989-1990	Chair, Longwood Vascular Biology Seminar Series, Harvard Medical School
1998-present	Course Director: OR 512.23 "Problems in Osseous Reconstruction", a 4-week Advanced Biomedical Sciences Course for 4th-year Harvard Medical and Dental Students
1998-2002	Oral and Maxillofacial Surgery Foundation Program Director: J. Glowacki Dental Student Research Training Award

## Names of Advisees and Trainees

Table of Trainees

Name	Training Level	Training Period	Degree Prior to Training	Title of research project	Current Position
Pettis, Gail	M.M.Sc. (HSDM)	9/1/84-6/30/87	D.D.S.	Tissue response to ceramic and composite implants in rats	Private Practice, Orthodontics, Seattle, WA
Libert, Ellen	D.M.Sc. (HSDM)	9/1/87-6/30/89	D.M.D.	Effects of flurbiprofen on osteoclastic bone resorption	Associate Dean of Admissions and Post-Graduate Education, Harvard School of Dental Medicine, Boston, MA
Wolf, Nancy	M.D. (HST)	9/1/87-6/30/89	Ph.D.	Young bone in old fish	Associate Professor, Department of Pathology, Case-Western Reserve, Cleveland, OH
Liggett, William	D.M.Sc. (HSDM)	9/1/87-6/30/91	D.M.D.	The ontogeny of the osteoclast: the influence of hormones, growth factors, and local mediators	Associate Professor, Hematology and Oncology, Johns Hopkins School of Medicine, Baltimore, MD
Perona, Barbara	Research Fellow	7/1/90-6/30/91	M.D.	Differences in osteocompatibility of resorbable or non-resorbable calcium phosphates in rat tibial wounds	Anesthesiologist, University of Iowa Medical Center
Mizuno, Shuichi	Ph.D. (Univ. of Tskuba)	8/1/90-8/30/97	M.Sc.	Chondroinduction by demineralized bone matrix in a three-dimensional culture device	Instructor, Orthopedic Research Laboratory, Brigham and Women's Hospital, Boston, MA
Shevde, Nirupama	D.M.Sc. (HSDM)	9/1/90-6/30/92	B.D.S.	The role of microenvironmental factors in osteoclast differentiation	Assistant Professor, Children's Hospital, University of Cincinnati, Cincinnati, OH
Tasuchida, Toymitsu	Research Fellow	1/1/91-6/30/91	M.D.	Bone morphologic protein and bone ingrowth	Professor, Chiba University, Japan
Azar, Haleh	M.M.Sc. (HSDM)	9/1/93-6/30/94	D.D.S.	Regulation of macrophage colony-stimulating factor and interleukin-6 receptors in osteoclast progenitors	Orthodontic Private Practice, Boston, MA

Name	Training Level	Training Period	Degree Prior to Training	Title of research project	Current Position
Lackey, Melissa	D.M.D. (HSDM)	7/1/96-3/1/98	B.A.	Regeneration of fetal rabbit osseous wounds	Resident, Oral Surgery, MGH and Harvard School of Dental Medicine, Boston, MA
Cheleuitte, Domingo	M.D. (HMS)	6/1/97-5/1/98	B.A.	Effect of age on bone marrow cytokines	Foot/Ankle Fellow, Dallas, TX
Mueller, Stefan	Research Fellow	9/1/97-5/1/99	M.D.	Effects of age on osteogenesis by human bone marrow	Resident, Anesthesiology, University of Zurich, Switzerland
Makhluf, Huda	Post-Doctoral Research Fellow	9/1/97-10/99	Ph.D.	Effect of age on osteoclastogenesis	Research Fellow, Baylor, Houston, TX
Eid, Karim	Research Fellow	9/98-12/99	M.D.	Effects of nutrients on osteoarthritic and normal human chondrocytes	Attending Orthopedist, Trauma Surgery, University of Zurich, Switzerland
Allemann, Florin	Research Fellow	4/1/99-10/15/00	M.D.	Regulation of chondrogenesis in 3-D culture	Trauma Resident, University of Zurich, Switzerland
Gordon, Catherine	Research Fellow	7/98-9/00	M.D.	Effects of DHEA on human bone marrow	Instructor, Adolescent and Pediatric Endocrinology, Children's Hospital, Boston, MA
Rubin, David	Research Fellow	11/1/99-4/1/00	Ph.D.	Chondrogenesis in vitro	Assistant Professor, Dept of Biology, Illinois State University, IL
Simon, Josef	Medical Student (HMS)	6/1/00-6/30/01	B.S.	Effects of estrogen status on osteoblastogenesis	HMS IV
Warden, Scott	Medical Student (HMS)	6/1/00-6/30/01	B.A.	Engineered chimeric joints for mouse knee transplantation	HMS IV
Shulten, Alcuin	D.M.Sc. (HSDM)	6/1/00-	D.D.S.	Effects of nicotine on distraction osteogenesis in rats	
Singh, Parmanand	Medical Student (HMS) Prematriculation Research Fellow	6/1/01-9/1/01	B.A.	Effects of sex steroids on osteoblast differentiation	HMS I
Zhou, Shuanhu	Post-doctoral Research Fellow	11/1/01-	Ph.D.	Gene expression in engineered tissues	
Forbes, Rachael	Dental Student	3/1/02-	B.S.	Effects of age and tissue source on chondroinduction in vitro	HSDM/HST II
Wycoff, Charles	Medical Student (HMS)	6/1/02-	Ph.D.	Engineered chimeric joints for mouse knee	HMS II

Name	Training Level	Training Period	Degree Prior to Training	Title of research project	Current Position
				transplantation	
Dehesi, Benjamin	Research Fellow	9/1/02-	M.D.	Articular cartilage repair in the minipig	
Kikuchi, Masanori	Research Fellow	10/1/02-	Ph.D.	Engineered bone tissue	
Lechpammer, Stanislav	Research Fellow	4/1/03-	M.D., Ph.D.	Angiogenesis and bone formation	

## 2. Regional, National, and International Contributions:

### a) Invited Presentations

#### Regional and National Invitations

February 18, 1983, Invited Lecture, "Experimental and Clinical Studies with Demineralized Bone Implants", Stryker Corp., Kalamazoo, MI.

March 4, 1983, Invited Orthopedic Rounds, Rhode Island Hospital, Brown Medical School, Providence, RI.

May 3-4, 1983, Invited Lecturer, NIH Workshop on "Local Mechanisms Regulating Bone Formation", NIDR, Bethesda, MD.

May 11-15, 1983, Faculty, "International Symposium on Tissue Repair", Tarpon Springs, FL.

June 5-7, 1983, Session Chairman, Bone Metabolism, Fifth Annual Meeting of the American Society for Bone and Mineral Research, San Antonio, TX.

November 19, 1983, Invited Speaker, "Basic Science Teaching Program", Brown University, Rhode Island Hospital, Providence, RI.

January 24, 1985, Invited Lecturer, American Academy of Orthopedic Surgeons, Las Vegas, NV.

January 31, 1985, Invited Lecturer, Southern California Bone Club, Irvine CA.

February 4, 1986, Symposium Speaker, "Biological Actions of Ansa", Scottsdale, AZ.

March 7, 1986, Invited Seminar, "Comparative Skeletal and Mineral Metabolism: From Shark to Man", Scripps Institute of Oceanography, La Jolla, CA.

March 12-14, 1986, Invited Symposium Speaker, American Association of Dental Research, Washington, DC

November 18, 1986, Invited Speaker, Cetus Corporation, Emeryville, CA.

December 16-17, 1986, Invited Speaker, Kansas City Bone and Mineral Club, Kansas City, MO.

January 9, 1987, Distinguished Lecture Series, The Hospital for Special Surgery, New York, NY.

May 14, 1987, Invited Speaker, Pfizer, Inc, Groton, CT.

September 27-29, 1987, Invited Lecturer, American Association of Tissue Banks, Washington, DC

March 1, 1988, Symposium Speaker, "Biological Actions of Ansaïd", Scottsdale, AZ.

May 9-13, 1988, Invited Symposium Speaker, Symposium on "Clinical Disorders of Bone and Mineral Metabolism", Detroit, MI.

July 20, 1988, Guest Lecturer, "Models for Studying Bone Metabolism", Pfizer, Groton, CT.

December 1-4, 1988, Invited Faculty, "Bone Grafting: Biology and Application for Maxillofacial Indications", San Diego, CA.

January 26-28, 1989, Invited Faculty, "Bone Grafts", Tampa, FL.

October 29 - November 1, 1989, Invited Participant, "Biological Restoration of Bone and Articular Cartilage", AAOS/NIH, Airlie, VA.

November 6, 1989, Endocrine Rounds, "Comparative Endocrine and Skeletal Metabolism", University of Indiana, IN.

May 13, 1991, Lecture, "Cellular Responses to Bone Constituents", Eli Lilly, Indianapolis, IN.

September 27, 1991, Combined Endocrine and Orthopedic Grand Rounds, St. Joseph's Medical Center, Bangor, ME.

September 27, 1991, Invited Seminar, "Comparative Skeletal and Mineral Metabolism", Dept of Zoology, University of Maine, Orono, ME.

April 30, 1993, Orthopaedic Grand Rounds, Yale University School of Medicine, New Haven, CT.

October 7-10, 1993, Invited Speaker, "Frontiers in Implant Science", The American Academy of Implant Dentistry, Annual Meeting, Dallas, TX.

October 21-22, 1993, Invited Visiting Professor, Department of the Army, Eisenhower Army Medical Center, Ft. Gordon, GA.

November 1, 1993, Invited Lecturer, "Biology of the Osteoclast", University of Arkansas for Medical Sciences, Little Rock, AR.

November 13-16, 1993, Section Leader and Speaker, AAOS/NIH Workshop on Bone Formation and Regeneration, Tampa, FL.

March 3, 1994, Invited Lecturer, "*In vitro* Assessment of Osteoinduction", American Red Cross, Holland Laboratories, Rockville, MD.

June 9, 1994, Invited Lecturer, "*In vitro* chondrogenesis by human dermal fibroblasts cultured with demineralized bone", International Conference on BMPs, Baltimore, MD.

July 22, 1994, Invited Lecturer, "Microenvironmental regulation of osteoclastogenesis", Pfizer, Groton, CT.

August 18, 1994, Invited Lecturer, "Microenvironmental regulation of osteoclastogenesis", Ligand, San Diego, CA.

October 9, 1994, Invited Speaker and Panelist, "Frontiers in Implant Science", The American Academy of Implant Dentistry, New Orleans, LA.



April 28, 1995, Invited Speaker, MTF International Symposium on Bone and Soft Tissue allografts, Washington, DC

May 5, 1995, Invited Seminar "Osseous Implantation", Department of Engineering, Brown University, Providence, RI.

September 9, 1995, Invited Speaker, Working Group on Aging and the Human Skeleton, Baltimore, MD.

May 1, 1996, Invited Lecture, "Biology of Bone Transfer", New York University Dental School, New York, NY.

October 10, 1996, Invited Presidential Lecture, "Repair and Regeneration of the Skeleton: From Shark to Man", St. Louis, MO.

October 11, 1996, Invited Seminar, "Role of Microenvironment of Osteoclast Differentiation", St. Louis, MO.

March 6, 1997, Invited Lecture, "Osteoporosis and Dental Implants", Academy of Osseointegration, San Francisco, CA.

June 4, 1997, Invited Lecture, "Differences in fetal and post-natal bone repair and responses to implants", International Conference on BMPs, Sacramento, CA.

June 5-6, 1997, Invited Lecture, "Juxtacrine Mechanisms of Osteoclastogenesis", Workshop on Bone and the Immune and Skeletal Systems, Bethesda, MD.

June 20-24, 1997, Invited Lecture, "Tissue Responses to Bone Substitute Materials", Periodontal Disease Gordon Research Conference, Henniker, NH.

October 24, 1997, Invited Lecture, "Angiogenesis and Fracture Healing", Fracture Repair Conference, AOS, Tampa, FL.

June 26, 1998, Endocrine Grand Rounds, "Mechanisms of Skeletal Aging", University of Arkansas Medical Center, Little Rock, AR.

September 19, 1998, Invited Lecture for Symposium on Tissue Engineering, "Role of Growth and Differentiation Factors in Tissue Engineering", Amer Assoc Oral Maxillofacial Surg Annual Meeting, New Orleans, LA.

October 2, 1998, Invited Lecture in Symposium on Biomaterials for the Face, American Society for Plastic and Reconstructive Surgery, Boston, MA.

October 30, 1999, "Relationships Among DHEAS, Skeletal IGF-I, IL-6, and Bone Density in Women". International Symposium on Endocrinology of Aging, Tempe, AZ

March 16, 2000, Invited Speaker, "Tissue Engineering and Musculoskeletal Repair: Outlook for the New Decade". Trends and Opportunities in the Orthopedic and Spine Surgery Market, MDI Conference, Orlando, Florida

November 29, 2000. Orthopedic Grand Rounds. "Skeletal Aging: From Bench to Bedside". University of Iowa Hospitals and Clinics, Iowa City, Iowa

March 13, 2001. Dean's Seminar. "Mechanisms of Skeletal Aging: From Bench to Bedside". MCP Hahnemann School of Medicine, Philadelphia, PA

March 14, 2001. Orthopedic Rounds. "Old and New Materials for Bone and Joint Reconstruction". MCP Hahnemann School of Medicine, Philadelphia, PA

August 28, 2001. Invited Lecture. "In Vitro Tests for Allograft Activity". 25th Annual meeting of the American Association of Tissue Banks, Washington, D.C.

March 19, 2002. Invited Lecture. "Histogenesis in Three-Dimensional Scaffolds". Engineering Tissue Growth - International Conference and Exposition, Pittsburgh, PA..

March 22, 2002. Invited Lecture. "Bioreactors for Cartilage Engineering". Stanford University Bio X Sponsored Symposium, Stanford, CA.

May 1, 2002. Lecture Series in Biomedical Engineering and Biosciences. "Histogenesis in Three-Dimensional Scaffolds." Rensselaer Polytechnic Institute, Troy, NY.

July 19, 2002. Invited Lecture. "Bone Healing in the Aged Patient". Texas Health Research Institute, Presbyterian Hospital of Plano Campus, Plano, TX.

Nov 21, 2002. Invited Lecture. "Histogenesis in Three-Dimensional Scaffolds". Cold Spring Harbor Winter Symposium on Tissue Engineering. Cold Spring Harbor, NY.

Mar 13, 2003. Invited Lecture. "RDA and Macroarrays to Identify Genes in Postnatal Chondroinduction by Demineralized Bone". AADR Symposium on Repair and Regeneration of Oral and Craniofacial Tissues, San Antonio, TX.

August 24, 2003. Invited Lecture. "Effects of Sterilants on Osteoinductivity". Annual meeting of the American Association of Tissue Banks, San Diego, CA,

## International Invitations

- April 2-3, 1982, Invited Speaker, First International Workshop: "The Effects of Calcitonins in Man", Florence, Italy.
- October 7-9, 1982, Invited Panelist, International Seminar on Calcitonin, Copenhagen, Denmark.
- October 16-24, 1983, Invited Participant, VIIIth International Conference on "Calcium Regulating Hormones", Kobe, Japan.
- October 19, 1983, Invited Lecturer, "Clinical and Experimental Applications of Induced Osteogenesis", Toray Industries, Tokyo, Japan.
- October 24, 1983, Invited Lecturer, "Clinical and Experimental Applications of Induced Osteogenesis", Sankyo Company, Tokyo, Japan.
- November 4-5, 1983, Invited Faculty, "First International Conference on Osteoporosis", Florence, Italy.
- December 16-17, 1983, Invited Faculty, "International Symposium on Metabolic Bone Diseases and Calcitonin", Lisbon, Portugal.
- October 2-4, 1984, Invited Faculty, "International Symposium on Calcitonin", Milan, Italy.
- November 7-9, 1985, Invited Faculty, "Second International Conference on Osteoporosis", Athens, Greece.
- November 2-3, 1986, Invited Faculty, "Middle East Calcitonin Symposium", Cairo, Egypt.
- October 13-15, 1987, Invited Participant, "Cell and Molecular Biology of Hard Tissues", CIBA Foundation Symposium, London, United Kingdom.
- September 9, 1989, Invited Speaker, "Closed Research Workshop on Calcitonin", Montreal, Canada.
- September 20-21, 1990, Osteoinduction by Demineralized Bone Implants. Invited Lecturer. First European Course on "Biomaterials in Reconstructive Surgery", Venice, Italy.
- December 3-4, 1990. Invited Faculty, "The Bone Biomaterial Interface", Toronto, Canada.
- January 11, 1996, Lecture, "Bone Reconstruction with Natural and Synthetic Materials", Niguarda Hospital, Milan, Italy.
- January 12, 1996, Panelist, "Consensus Conference on Medical, Legal, and Ethical Aspects on the Use of Synthetic Biomaterials and Tissue Engineering", University of Milan, Milan, Italy.
- June 21, 1997, Lecture, "Potential roles of bone marrow stroma in human skeletal metabolism", IV Workshop on Osteobiology Conference, Salsomaggiore, Italy.
- October 4, 1997, Invited Lecture, "Bone substitute materials for dental implantology", Annual Meeting of German Dental Implant Society, Wurtzburg, Germany.
- January 20, 1998, Invited Lecture, NAIR Workshop on Tissue Engineering, Tsukuba, Japan.
- June 5, 1999, Invited Lecture, "Role of the Bone Marrow in Skeletal Aging", Osteobiology Workshop, Gallipoli, Italy.

November 6-7, 1999, Invited Lecture, "Distraction Osteogenesis of the Porcine Mandible", AO-FORK, Zurich, Switzerland

December 2-3, 1999. Invited Lecture, "Construction and Regulation of Three-Dimensional Bone Tissue In Vitro", Bone Engineering Conference, Totonto, Canada

September 23, 2000. Meet-The-Professor. "Bone Marrow and Osteoclasts". Annual Meeting of the ASBMR, Toronto, Canada

October 20, 2002. Invited Lecture. "Angiogenesis and Fracture Healing". Annual meeting of the Consortium of Italian Orthopedic Societies, Venice, Italy

October 8, 2003. Seminar. "Distraction Osteogenesis", University of Amsterdam, Amsterdam, The Netherlands.

October 9, 2003. Invited Address. "Mesenchymal Precursor Cells and Differentiation Pathways ion Bone Repair", Bone 2003, Maastricht, The Netherlands.

October 10, 2003. Oral presentation. "Effect of Nictotine of Distraction Osteogenesis", Bone 2003, Maastricht, The Netherlands.

**b) Professional and Educational Leadership Role**

- 1989 Task Force for Orthopedic Knowledge Update 3: Home Study Syllabus, American Academy of Orthopedic Surgeons
- 2003 Reviewer for Orthopedic Operating Room Manual, Second Edition, National Association of Orthopedic Nurses

### **PART III: Bibliography**

#### **Original, Peer-Reviewed Articles:**

1. Glowacki Nold J, Kang AH, Gross J. Collagen molecules: distribution of alpha chains. *Science* 1970;170:1096-98.
2. Glowacki Nold J, Belsey R. Comparative studies of rat, human, and chick vitamin D binding proteins. *Fed Proc* 1973;32:917.
3. Belsey R, Clark MB, Bernat MJF, Glowacki J, Deluca HF, Potts JR. The physiological significance of plasma transport of vitamin D and D metabolites. *Amer J Med* 1974;57:50-56.
4. Kaban LB, Glowacki J, Murray JE. Repair of experimental mandibular bone defects in rats. *Surg Forum* 1979;30:519-521.
5. Mulliken JB, Glowacki J. Induced osteogenesis for repair and construction in the craniofacial region. *Plastic Reconstr Surg* 1980;65:553-559.
6. Mulliken JB, Healey NA, Glowacki J. Povidone-iodine and tensile strength of wounds in rats. *J Trauma* 1980;20:323-324.
7. Hillelson RL, Glowacki J, Healey NA, Mulliken JB. A microangiographic study of hematoma-associated flap necrosis and salvage with isoxsuprine. *Plastic Reconstr Surg* 1980;66:528-531.
8. Glowacki J, Altobelli D, Mulliken JB. The fate of mineralized and demineralized osseous implants in cranial defects. *Calcif Tissue Int* 1981;33:71-76.
9. Kaban LB, Glowacki J. Induced osteogenesis in the repair of experimental mandibular defects in rats. *J Dent Res* 1981;60:1356-1364.
10. Upton J, Sohn SA, Glowacki J. Neocartilage derived from transplanted perichondrium: What is it? *Plastic Reconstr Surg* 1981;68:166-172.
11. Glowacki J, Gross J. Self-assembly of mixtures of collagen alpha-chains. *Biochem Biophys Acta* 1981;668:216-221.
12. Glowacki J, Kaban LB, Murray JE, Folkman J, Mulliken JB. Application of the biological principle of induced osteogenesis for craniofacial defects. *Lancet* 1981;(1):959-963.
13. Mulliken JB, Glowacki J, Kaban LB, Folkman J, Murray JE. Use of demineralized allogenic bone implants for the correction of maxillocraniofacial deformities. *Ann Surg* 1981;194:366-372.
14. Mulliken JB, Glowacki J. Hemangiomas and vascular malformations of infants and children: a classification based on endothelial characteristics. *Plastic Reconstr Surg* 1982;69:412-420.
15. Glowacki J, Mulliken JB. Mast cells in hemangiomas and vascular malformations. *Pediatr* 1982;70:48-51.
16. Holtrop ME, Cox KA, Glowacki J. Cells of mononuclear/phagocytic system resorb implanted bone matrix. *Calc Tissue Int* 1982;34:488-494.
17. Kaban LB, Mulliken JB, Glowacki J. Treatment of jaw defects with demineralized bone implants. *J Oral Maxillofacial Surg* 1982;40:623-626.

18. Glowacki J, Deftos LJ, Mayer E, Norman AW, Henry H. Calcium-regulating hormones and skeletal metabolism in sharks. *Calcif Tissue Int* 1982;34:S22-23.
19. Healey NA, Mulliken JB, Glowacki J. Studies of rat calvarial regeneration. *Surg Forum* 1982;33:574-575.
20. Glowacki J. Studies on the regulation of bone synthesis and bone resorption. *Prog Clin Biol Res* 1982;101:83-91.
21. Sonis ST, Kaban LB, Glowacki J. Clinical trial of demineralized bone powder in the treatment of periodontal defects. *J Oral Med* 1983;38:117-121.
22. Glowacki J, Trepman E, Folkman J. Cell shape and phenotypic expression in chondrocytes. *Proc Soc Exp Biol Med* 1983;172:93-98.
23. Glowacki J. The effects of heparin and protamine on resorption of bone particles. *Life Sciences* 1983;33:1019-1024.
24. Shafer DM, Kaban LB, Glowacki J, Walker PS. Physical properties of demineralized bone implants in rat subcutaneous pouches. *J Dental Res* 1983;62:195-196.
25. Finn MC, Glowacki J, Mulliken JB. Congenital vascular lesions: clinical application of a new classification. *J Pediat Surg* 1983;18:894-900.
26. Upton J, Boyajian M, Mulliken JB, Glowacki J. The use of demineralized xenogeneic bone implants to correct phalangeal defects: a case report. *J Hand Surg* 1984;9A:388-391.
27. Lee AK, Von Beuzekam M, Glowacki J, Langer RS. Inhibitors, enzymes, and growth factors from shark cartilage. *Compar Biochem Physiol* 1984;78B:1223-1226.
28. Lian JB, Tassinari M, Glowacki J. Resorption of implanted bone prepared from normal and warfarin-treated rats. *J Clin Invest* 1984;63:998-1002.
29. Kaban LB, Glowacki J. Augmentation of the rat mandibular ridge with demineralized bone implants. *J Dental Res* 1984;63:998-1002.
30. Mulliken JB, Kaban LB, Glowacki J. Induced osteogenesis: The biological principle and clinical applications. *J Surg Res* 1984;37:487-496.
31. Glowacki J, O'Sullivan J, Miller M, Wilkie DW, Deftos LJ. Calcitonin produces hypercalcemia in leopard sharks. *Endocrinology* 1985;116:827-829.
32. Glowacki J, Mulliken JB. Demineralized bone implants. *Clin Plastic Surg* 1985;12:223-41.
33. Dethlefsen SM, Mulliken JB, Glowacki J. An ultrastructural study of mast cell interactions in hemangiomas. *Ultrastruct Path* 1986;10:175-183.
34. Glowacki J, Cox KA, O'Sullivan J, Wilkie DW, Deftos LJ. Osteoclasts can be induced in fish having an acellular bony skeleton. *Proc Natl Acad Sci (USA)* 1986;83:4104-4107.
35. Glowacki J, Cox KA. Osteoclast features of cells that resorb bone implants in rats. *Calcif Tissue Int* 1986;39:97-103.
36. Glowacki J, Jasty M, Goldring S. Comparison of multinucleated cells elicited in rats by particulate bone, polyethylene, or polymethylmethacrylate. *J Bone Mineral Res* 1986;1:327-331.

37. Glowacki J. Cartilage and bone repair: experimental and clinical studies. *Arthroscopy* 1986;2:169-173.
38. Gerstenfeld LC, Chipman SD, Glowacki J, Lian JB. Expression of differentiated function by mineralizing cultures of chicken osteoblasts. *Devel Biol* 1987;122:49-60.
39. Glowacki J, Lian JB. Impaired recruitment and differentiation of osteoclast progenitors by osteocalcin-deplete bone implants. *Cell Diff* 1987;21:247-254.
40. Strause L, Saltman P, Glowacki J. The effect of deficiencies of manganese and copper on osteoinduction and on resorption of bone particles in rats. *Calcif Tissue Int* 1987;41:145-150.
41. Anklesaria P, Kase K, Glowacki J, Holland CA, Sakakeeny MA, Greenberger JS. Engraftment of a clonal bone marrow stromal cell line *in vitro* stimulates hematopoietic recovery from total body irradiation. *Proc Natl Acad Sci (USA)* 1987;84:7681-7685.
42. Goldring SR, Roelke M, Glowacki J. Multinucleated cells elicited in response to implants of devitalized bone particles possess receptors for calcitonin. *J Bone Mineral Res* 1988;3:117-120.
43. Glowacki J, Cox KA, Wilcon S. Impaired osteoclast differentiation in subcutaneous implants of bone particles in osteopetrotic mutants. *Bone Mineral* 1989;5:271-278.
44. Glowacki J, Rey C, Cox K, Lian J. Effects of bone matrix components on osteoclast differentiation. *Conn Tissue Res* 1989;20:121-129.
45. Pettis GY, Kaban LB, Glowacki J. Tissue response to composite ceramic hydroxyapatite/demineralized bone implants. *J Oral Maxillofacial Surg* 1990;48:1068-1074.
46. Glowacki J, Rey C, Glimcher MJ, Cox KA, Lian J. A role for osteocalcin in osteoclast differentiation. *J Cellular Biochem* 1991;45:292-302.
47. DeFranco DJ, Glowacki J, Cox KA, Lian JB. Normal bone particles are preferentially resorbed in the presence of osteocalcin-deficient bone particles *in vivo*. *Calcif Tissue Int* 1991;49:46-54.
48. Upton J, Glowacki J. Hand reconstruction with allograft demineralized bone: 26 implants in 12 patients. *J Hand Surg* 1992;17A:704-713.
49. Bleiberg I, Glowacki J, Anklesaria P, Greenberger JS. Origin of stromal cells associated with osteoclast recruitment in subcutaneous implant of bone particles in chimeric mice. *Exp Hemat* 1992;20:957-961.
50. Mizuno S, Lycette C, Quinto C, Glowacki J. A collagen/DBP sponge system designed for *in vitro* analysis of chondroinduction. *Mat Res Soc Symp Proc* 1992;252:133-140.
51. DeFranco DJ, Lian JB, Glowacki J. Differential effects of glucocorticoid on recruitment and activity of osteoclasts induced by normal and osteocalcin-deficient bone implanted in rats. *Endocrinology* 1992;131:114-121.
52. Liggett WH Jr, Shevde N, Anklesaria P, Sohoni S, Greenberger JS, Glowacki J. Effects of macrophage-colony stimulating factor and granulocyte-macrophage-colony stimulating factor on osteoclastic differentiation of long-term bone marrow culture-derived hematopoietic progenitor cells. *Stem Cells* 1993;11:398-411.

53. Karaplis AC, Luz A, Glowacki J, Bronson RT, Tybulewicz VLJ, Kronenberg HM, Mulligan RC. Lethal skeletal dysplasia from targeted disruption of the parathyroid hormone-related peptide (PTHrP) gene. *Genes Develop* 1994;8:277-289.
54. Chen NT, Glowacki J, Bucky LP, Hong HZ, Kim WK, Yaremchuk MJ. The roles of revascularization and resorption on endurance of craniofacial onlay bone grafts in the rabbit. *Plast Reconstr Surg* 1994;93:714-724.
55. Liggett WH Jr, Lian JB, Greenberger JS, Glowacki J. Osteocalcin promotes differentiation of putative osteoclast progenitors from murine long-term bone marrow cultures. *J Cellular Biochem* 1994;56:190-199.
56. Shevde N, Anklesaria P, Greenberger JS, Bleiberg I, Glowacki J. Stromal cell-mediated stimulation of osteoclastogenesis. *Proc Soc Exp Biol Med* 1994;205:306-315.
57. Goldring MB, Birkhead JR, Suen LF, Yamin R, Mizuno S, Glowacki J, Arbiser J, Apperley JF. Interleukin-1 $\beta$ -modulated gene expression in immortalized human chondrocytes. *J Clin Invest* 1994;94:2307-2316.
58. Smith-Vaniz WF, Kaufman LS, Glowacki J. Species-specific patterns of hyperostosis in marine teleost fishes. *Marine Biol* 1995;121:573-580.
59. Glowacki J. Influence of age on human marrow. *Calcif Tissue Int* 1995;56S:50-51.
60. Glowacki J. Cellular reactions to bone-derived material. *Clin Orthop Rel Res* 1996;324:47-54.
61. Gerstenfeld LC, Uporova T, Schmidt J, Strauss PG, Shih SD, Huang L-F, Gundberg C, Mizuno S, Glowacki J. Osteogenic potential of murine osteosarcoma cells: comparison of bone-specific gene expression in *in vitro* and *in vivo* conditions. *Lab Invest* 1996;74:895-906.
62. Mizuno S, Glowacki J. A three-dimensional composite of demineralized bone powder and collagen for *in vitro* analysis of chondroinduction of human dermal fibroblasts. *Biomaterials* 1996;17:1819-1825.
63. Mizuno S, Glowacki J. Chondroinduction of human dermal fibroblasts by demineralized bone in three-dimensional culture. *Exp Cell Res* 1996;227:89-97.
64. Darling JM, Goldring SR, Harada Y, Handell ML, Glowacki J, Gravalles EM. Multinucleated cells in pigmented villonodular synovitis and giant cell tumor of tendon sheath express features of osteoclasts. *Am J Path* 1997;150:1383-1393.
65. Rosen CJ, Verault D, Steffens C, Cheleuitte D, Glowacki J. Effects of age and estrogen status on the skeletal IGF regulatory system: studies with human marrow. *Endocrine* 1997;7:77-80.
66. House MG, Kohlmeier L, Chattopadhyay N, Kifor O, Yamaguchi T, LeBoff M, Glowacki J, Brown EM. Expression of an extracellular calcium-sensing receptor in human and mouse bone marrow cells. *J Bone Min Res* 1997;12:1959-1970.
67. Orgill DP, Ehret FW, Regan JF, Glowacki J, Mulliken JB. Polyethylene glycomicrofibrillar collagen composite as a new resorbable hemostatic bone wax. *J Biomed Mater Res* 1998;39:358-363.
68. Stelnicki EJ, Vanderwall K, Hoffman WY, Harrison MR, Glowacki J, Longaker MT. A new *in utero* sheep model for unilateral coronal craniosynostosis. *Plast Reconstr Surg* 1998;101:278-286.
69. Glowacki J. Knochenersatzmaterialien in der dentalen implantologie. *Implantologie* 1998;7-8.



70. Rosen CJ, Glowacki J, Craig W. Sex steroids, the insulin-like growth factor regulatory system, and aging: implications for the management of older postmenopausal women. *J Nutrition, Health & Aging* 1998;2:1-6.
71. Glowacki J, Mizuno S, Greenberger JS. Perfusion enhances functions of bone marrow stromal cells in three-dimensional culture. *Cell Trans* 1998;7:319-326.
72. Cheleuitte D, Mizuno S, Glowacki J. In vitro secretion of cytokines of human bone marrow: effects of age and estrogen status. *J Clin Endo Metab* 1998;83:2043-2051.
73. Glowacki J. Angiogenesis in fracture repair. *Clin Orthop Rel Res* 1998;355S:82-89.
74. Glowacki J, Yates K, Little G, Mizuno S. Induced chondroblastic differentiation of human fibroblasts by three-dimensional culture with demineralized bone matrix. *Mat Sci Eng C* 1998;6:199-203.
75. Mizuno S, Ushida T, Tateishi T, Glowacki J. Effects of physical stimulation on chondrogenesis in vitro. *Mat Sci Eng C* 1998;6:301-306.
76. LeBoff M, Kohlmeier L, Hurwitz S, Franklin J, Wright J, Glowacki J. Occult vitamin D deficiency in postmenopausal American women with acute femur fracture. *J Amer Med Assoc* 1999;16:1505-1511.
77. Mueller SM, Mizuno S, Gerstenfeld LC, Glowacki J. Medium perfusion enhances osteogenesis by murine osteosarcoma cells in three-dimensional collagen sponges. *J Bone Mineral Res* 1999;14: 2118-2126.
78. Rosenthal RK, Folkman J, Glowacki J. Demineralized bone implants for non-union fractures, bone cysts, and fibrous bone lesions. *Clin Orthop Rel Res*. 364:61-69, 1999.
79. Makhluf HA, Mueller SM, Mizuno S, Glowacki J. Age-related decline in osteoprotegerin expression by human bone marrow cells cultured in three-dimensional collagen sponges. *Biochem Biophys Res Comm* 2000;268:669-672.
80. Troulis MJ, Glowacki J, Perrott DH, Kaban LB. Effects of latency and rate on bone formation in a porcine mandibular distraction model. *J Oral Maxillofac Surg* 2000;58:507-513.
81. Haden S, Glowacki J, Hurwitz S, Rosen C, LeBoff MS. Effects of age on serum dehydroepiandrosterone, IGF-I, and IL-6 in women. *Calcified Tissue Int*. 2000;66:414-418.
82. Allemann F, Mizuno S, Eid K, Yates KE, Zaleske D, Glowacki J. Effects of hyaluronan on engineered articular cartilage ECM gene expression in 3-dimensional collagen scaffolds. *J Biomed Mat Res*. 2001;55:13-19.
83. Castano FJ, Troulis MJ, Glowacki J, Kaban LB, Yates KE. Proliferation of masseter myocytes after distraction osteogenesis of the porcine mandible. *J Oral Maxillofac Surg* 2001;59: 302-307.
84. Yates KE, Mizuno S, Glowacki J. Early shifts in gene expression during chondroinduction of human dermal fibroblasts. *Exp Cell Res* 2001;265:203-211.
85. Mizuno S, Allemann F, Glowacki J. Effects of medium perfusion on matrix production by bovine chondrocytes in three-dimensional collagen sponges. *J Biomed Mat Res* 2001;56:368-75.
86. Eid K, Zelicof S, Perona BP, Sledge CB, Glowacki J. Tissue reactions to particles of bone-substitute materials in intraosseous and heterotopic sites in rats: Discrimination of osteoinduction, osteocompatibility, and inflammation. *J Orthop Res* 2001;9: 58-65.

87. Eid K, Chen E, Griffith L, Glowacki J. Effect of RGD-coating on osteocompatibility of PLGA-polymer disks in a rat tibial wound. *J Biomed Mat Res* 2001;57:224-231.
88. Mueller SM, Glowacki J. Age-related decline in the osteogenic potential of human bone marrow cells cultured in three-dimensional collagen sponges. *J Cell Biochem* 2001;82:583-590.
89. August M, Chung K, Chang Y, Glowacki J. Influence of estrogen status on implant osseointegration. *J Oral Maxillofacial Surg* 2001;59:1285-1289.
90. Gordon C, LeBoff MS, Glowacki J. Adrenal and gonadal steroids inhibit IL-6 secretion by human marrow cells. *Cytokine* 2001;16:178-86.
91. Navarro FA, Mizuno S, Huertas JC, Glowacki J, Orgill DP. Perfusion of medium improves growth of human oral neomucosal tissue constructs. *Wound Repair Regen* 2001; 9: 507-512.
92. Yates KE, Troulis MJ, Kaban LB, Glowacki J. IGF-I, TGF- $\beta$ , BMP-4 are expressed during distraction osteogenesis of the pig mandible. *Int J Oral Maxillofac Surg* 2002; 31:173-178.
93. Mizuno S, Tateishi T, Ushida T, Glowacki J. Hydrostatic fluid pressure enhances matrix synthesis and accumulation by bovine chondrocytes in three-dimensional culture. *J Cell Phys* 2002;193:319-27.
94. Halpern JH, Sholar MB, Glowacki J, Mello NK, Mendelson JH, Siegel AJ. Diminished interleukin-6 response to proinflammatory challenge in men and women after i.v. cocaine administration. *J Clin Endo Metab* 2003; 88: 1188-93.
95. Kaban LB, Thurmüller P, Troulis MJ, Glowacki J, Wahl D, Linke B, Rahn B, Perrott DH. Correlation of biomechanical stiffness with plain radiographic and ultrasound data in an experimental mandibular distraction wound. *Int J Oral Maxillofac Surg* 2003; 32: 296-304.
96. Schulten AJM, Zimmermann CE, Glowacki J. Osteoclastic bone resorption around intraosseous screws in rat and pig mandibles. *Microsc Res Tech* 2003; 61: 533-539.
97. Yates KE, Glowacki J. Gene expression changes in an in vitro model of chondroinduction: A comparison of two methods. *Wound Rep Regen* 2003; 11: 386-92.
98. Yates KE, Glowacki J. Altered expression of connective tissue genes in postnatal chondroinduced human dermal fibroblasts. *Conn Tissue Res* 2003; 44:121-7.
99. Perrott DH, Rahn B, Wahl D, Linke B, Thurmüller P, Troulis M, Glowacki J, Kaban LB. Development of a mechanical testing system for a mandibular distraction wound. *Int J Oral Maxillofac Surg*. In Press.
100. Zaleske D, Peretti G, Allemann F, Strongin D, MacLean R, Yates KE, Glowacki J. Engineering a joint: A chimeric construct with bovine chondrocytes in a devitalized chick knee. *Tissue Engineering* 2003: In Press.
101. Yates KE, Forbes R, Glowacki J. New chondrocyte genes discovered by representational difference analysis of chondroinduced human fibroblasts. *Cells Tiss Organs*. In Press.
102. Glowacki J, Shusterman EM, Troulis M, Holmes R, Perrott D, Kaban LB. Distraction osteogenesis of the porcine mandible: histomorphometric evaluation of bone. *Plastic Reconstr Surg* In Press.
103. Glowacki J, Hurwitz S, Thornhill TS, Kelley M, LeBoff ML. Osteoporosis and vitamin D deficiency among postmenopausal osteoarthritic women undergoing total hip arthroplasty. *J Bone Joint Surg*. In 2003: In Press.

104. Vastardis H, Mulliken JB, Glowacki J. Unilateral coronal synostosis: A histomorphometric study. *Cleft Palate-Craniofac J* 2004: In Press.

### Proceedings of Meetings:

1. Belsey R, Bernat MJF, Nold Glowacki J, Clark M, DeLuca HF, Potts JT Jr. Selective binding properties of chick vitamin D transport protein: Physiological significance and applications to specific vitamin D assays. *Proc 55th Annual Meeting of the Endocrine Society*, Lippincott Press, Philadelphia, 1973.
2. Clark MB, Nold Glowacki J, Bernat MJF, Belsey R, DeLuca HF, Potts JT Jr. Selective binding properties of vitamin D transport proteins: Physiological significance and application to specific vitamin D assays. In: Taylor S, ed. Endocrinology. London: W. Heinemann Medical Books, Ltd; 1974. p.269-275.
3. Lian JB, Glowacki J, Glimcher MJ. The occurrence of gamma-carboxyglutamic acid in elasmobranch endoskeleton. In: Suttie JW, ed. Chemistry and Function of Vitamin K Dependent Plasma Proteins. Madison, 1979. Dixon R, Sarnat BG, eds. Factors and Mechanisms Influencing Bone Growth; 1982. p.83-91.
4. Glowacki J. Studies on the regulation of bone synthesis and bone resorption. In: Dixon R, Sarnat BG, eds. Factors and Mechanisms Influencing Bone Growth. New York: A.R. Liss; 1982. p.83-91.
5. Glowacki J, Deftos LJ, Mayer E, Norman A, Henry H. Chondrichthyes cannot resorb implanted bone and have calcium-regulating hormones. In: Norman AW, Schaefer K, Herrath DV, Grigoleit HG, eds. Vitamin D: Chemical, Biochemical, and Clinical Endocrinology of Calcium. Berlin: de Gruyter Publishing; 1982. p.613-615.
6. Glowacki J, Deftos LJ. The effects of calcitonin on bone formation. In: Gennari C, Segre G, eds. The Effects of Calcitonin in Man. Milan: Masson Italia Ed; 1983. p.133-140.
7. Glowacki J, Deftos LJ. Skeletal and mineral metabolism in sharks, rays, and fish. Cohn DV, Potts JT, Fujita I, eds. In: Endocrine Control of Bone and Calcium Metabolism. Elsevier, 1984; p.194-196.
8. Glowacki J, Kaban LB, Sonis ST, Rosenthal RK, Mulliken JB. Physiological aspects of bone repair using demineralized bone. Hunt TK, Heppenstall RB, Pines E, Rovee DT, eds. In: Tissue Repair: Biological and Clinical Aspects of Soft and Hard Tissue Repair. Praeger, 1984. p.265-280.
9. Glowacki J, Lian JB. Impaired recruitment of osteoclast progenitors by osteocalcin-deficient bone implants. In: The Chemistry and Biology of Mineralized Tissues. W.T. Butler, ed. Birmingham; 1985. p.164-169.
10. Glowacki, J, Deftos LJ. The effects of calcitonin on cartilage growth. In: Calcitonin. A Pecile, Ed., Elsevier Science Publishers BV 1985. p.32-33.
11. Glowacki J. Factors that stimulate bone formation. In: Osteoporosis: Social and Clinical Aspects. Milano:Masson Italia Editori P.A.; 1986. p.93-103.
12. Lian JB, Stein GS, Gerstenfeld L, Glowacki J: Gene expression and functional studies of the vitamin-K-dependent protein of bone, osteocalcin. In: Clinical Impact of Bone and Connective Tissue Markers. E.Lindh and J.Thorell, eds. Harcourt, Brace, Jovanovich; 1989. p.121-136.

13. Glowacki J, Milhaud G, Benson A, Wagner G, Cox K, Fargher R, Copp H. Effect of calcium challenge on secretion of stanniocalcin (teleocalcin/hypocalcin) in adult seawater Coho salmon. In: Calcium Regulation & Bone Metabolism, DV Cohn, FH Glorieux, TJ Martin, eds, Elsevier; 1990. p.74-79.
14. Gerstenfeld LC, Shih S, George C, Mizuno S, Glowacki J. Effect of overexpression of bone sialoprotein on osteosarcoma tissue growth and mineralization. In: The Chemistry and Biology of Mineralized Tissues, M Goldberg, A Bosky, C Robinson, eds, Am Acad Orthop Surg, Chicago, IL;1999.
15. Glowacki J. Engineered cartilage, bone, joints, and menisci. *Cells, Tissues, Organs*. 2001;169:302-308.
16. Glowacki J, Yates KE, Warden S, Allemann F, Peretti G, Strongin G, MacLean R, Zaleske D. Engineering a Biological Joint. In: Reparative Medicine: Growing Tissues and Organs. J.D.Sipe, C.A. Kelley, L.A. McNichol (eds) Ann NY Acad Sci 2002; 961: 126-9.

#### **Review Articles and Book Chapters:**

1. Deftos LJ, Glowacki J. Mechanisms of Bone Disease. In: Pathophysiology: Altered Regulatory Mechanisms in Disease. Third edition. Frolich ED, ed. Philadelphia: Lippincott, 1984, p.445-467.
2. Glowacki J. Morphometric Analysis in Aging Bone. In: Osteoporosis: Social and Clinical Aspects. Gennari C, Segre G, eds. Amsterdam: Excerpta Medica, 1984, p.133-140.
3. Glowacki J. Cellular Responses to Bone-Derived Materials. In: The Restoration of Bone and Articular Surfaces. G. Friedlaender and V.M. Goldberg, eds, American Academy of Orthopedic Surgeons, 1991, p.55-73.
4. Kaban LB, Glowacki J. Demineralized Bone Matrix and Hydroxylapatite: Substitutes for Autogenous Bone for Contour Augmentation of the Craniofacial Skeleton. In: Aesthetic Contouring of the Craniofacial Skeleton, D.K. Ousterhout, ed, Little, Brown, and Co., Boston, 1991, p.155-164.
5. Glowacki J, Spector M. Tissue Responses to Bone-Derived and Synthetic Materials. In: The Bone-Biomaterial Interface. J Davies, ed, University of Toronto Press, 1991, p.265-274.
6. Glowacki J. Tissue Response to Bone-Derived Materials. In: Bone Grafts: From Basic Science to Clinical Application, M.B. Habal, A.H. Reddi, eds. W.B. Saunders, 1992, p.84-92.
7. Glowacki J. The Influence of Matrix Components on Osteoclasts. In: The Biology and Physiology of the Osteoclast. B.R. Rifkin, C.V. Gay, eds, CRC Press, Boca Raton. 1992, p.187-206.
8. Glowacki J. Inflammation and Bone Formation. In: Bone Formation and Repair, C.T. Brighton, G.E. Friedlaender, J.M. Lane, eds, American Academy of Orthopedic Surgeons, 1994, p. 395-403.
9. Glowacki J. Cellular and Biochemical Aspects of Bone Remodeling. In: Osteoporosis in Clinical Medicine: Principles and Practice, C.J. Rosen, ed., Humana Press, Totowa, NY. 1996, p. 3-15.
10. Glowacki J. Cellular Models of Aging. In: The Aging Skeleton, Rosen C, Glowacki J, Bilzekian JP, eds., Academic Press, San Diego, CA,1999, pp 59-73.
11. LeBoff M and Glowacki J. Sex Steroids, Aging, and Bone. In: The Aging Skeleton, Rosen C, Glowacki J, Bilzekian JP, eds., Academic Press, San Diego, CA,1999, p. 159-174.

12. Gordon CM, Glowacki J, LeBoff MS. DHEA and the Skeleton (Through the Ages). *Endocrine* 1999;11:1-11.
13. Glowacki J. Advances in Skeletal Biology. *The Harvard Orthoped J* 1999; 1:63-66.
14. Glowacki J. In Vitro Engineering of Cartilage. *J Rehabil Res Dev* 2000; 37:171-177.
15. Mueller SM and Glowacki J. Construction and Regulation of Three-Dimensional Bone Tissue In Vitro. In: Bone Engineering, JE Davies, Ed., em squared, Inc, Toronto, 2000; pp 473-487.
16. Glowacki J. Aging and the Skeleton. *The Harvard Orthoped J* 2000; 2:71-74.
17. Glowacki J, Mizuno S. Histogenesis in Three-Dimensional Scaffolds. *Orthop J Harvard Med School* 2001; 3: 58-60.
18. August M, Glowacki J. Temporomandibular Joint Syndrome. In: Primary Care of Women, 2nd Edition. KJ Carlson, SA Eisenstat (Eds). Mosby, St. Louis, 2002; pp 66-70.
19. Glowacki J. Mechanisms of Biomineralization, In: Disorders of Bone and Mineral Metabolism, F Coe and M Favus, Eds. Lippincott, Williams & Wilkins, Philadelphia, 2002; pp 227-234.
20. Murray M, Mankin HJ, Glowacki J. The Musculoskeletal System. In: The Physiological Basis of Surgery, 3rd Edition, JP O'Leary (Ed), Lippincott, Williams & Wilkins, Philadelphia, 2002; pp 577-95.
21. Glowacki J, Zaleske DJ. Engineering A Biological Joint. *Orthop J Harvard Med School* 2002;4:74-76.
22. Minas T, Glowacki J. Cartilage Repair and Regeneration. In: Operative Arthroscopy, 3rd Edition, J.B. McGinty (Ed.), Lippincott, Williams & Wilkins, Philadelphia, 2002; pp 127-138.
23. Simon J, LeBoff MS, Wright J, Glowacki J. Vitamin D and Fractures. *J Nutr Health Aging* 2002;6:406-412.
24. Glowacki J. Histogenesis. Encyclopedia of Biomaterials and Biomedical Engineering. G. Wnek, G. Bowlin (Eds.), Dekker, Inc., New York, In Press

#### **Book Reviews, Editorials, and Commentary:**

1. Glowacki J. *Editorial review of* Fundamental and Clinical Bone Physiology. Urist MR, ed. In: *New Engl J Med* 1982; 306.
2. Mulliken JB, Glowacki J. *Discussion of* Classification of pediatric vascular lesions. In: *Plastic Reconstr Surg* 1982;70:120-121.
3. Glowacki J. *Editorial review of* Women Scientists in America: Struggles and Strategies to 1940. By Rossiter MW. In: *New Engl J Med* 1983;308:1368-1369.
4. Glowacki J. *Editorial review of* Extracellular Matrix Biochemistry. Piez KA, Reddi AH, eds. In: *BioScience*. 1985; 35:316.

5. Glowacki J. *Discussion of* The early revascularization of membranous bone. In: Plastic Reconstr Surg 1985;76:515-516.
6. Glowacki J. *Editorial review of* Normal and Abnormal Bone Growth: Basic and Clinical Research. Dixon AD, Sarnat BG, eds. In: Plastic Reconstr Surg 1987;79:484-485.
7. Glowacki J. *Editorial review of* The Law of Bone Remodeling. By Wolff J. In: Plastic Reconstr Surg. 1988;82: 717-718.
8. Glowacki J. *Discussion of* Craniofacial onlay bone grafting. In: Plastic Reconstr Surg. 1990; 85:15.
9. Glowacki J, Mulliken JB. *Discussion of* Enhanced healing of large cranial defects. In: Plastic Reconstr Surg 1993;92:601-602.
10. Glowacki J. *Discussion of* Bone formation and implant degradation of coralline porous ceramics placed in bone and ectopic sites. In: J Oral Maxillofacial Surg 1995;53:922-923.
11. Glowacki J. *Discussion of* Experimental reconstruction of the mandible using polylactic acid tubes and basic fibroblast growth factor in alloplastic scaffolds. In: J Oral Maxillofac Surg 1998;56:626-627.
12. Mizuno S and Glowacki J. *Editorial review of* Dynamics of Bone and Cartilage Metabolism. MJ Seibel, SR Robbins, JP Bilezikian (Eds). In: J Bone Miner Res 2000;15:2058-9.
13. Glowacki J, Zaleske DJ. Cartilage repair, biology, and surgery. Arch Ortoped Rheum 114:1-3, 2003.

#### **Books and Monographs:**

1. Rosen C, Glowacki J, Bilezikian JP (eds) The Aging Skeleton, Academic Press, San Diego, CA, 1999.

#### **Theses:**

1. Glowacki J. The effect of ethanol on protein synthesis *in vitro*. Baccalaureate Honors Thesis, Boston University, 1966.
2. Nold, J Glowacki. Maturation and molecular organization of collagen. Thesis, Harvard University, 1973.

#### **Patents:**

Glowacki et al.; #4,440,750; 4/3/1984, Osteogenic Composition and Method.

Laurencin et al.; #5,356,630; 10/18/1994, Delivery System for Controlled Release of Bioactive Factors.

Laurencin et al.; #5,545,409; 8/13/1996, Delivery System for Controlled Release of Bioactive Factors.

Laurencin et al.; #5,629,009; 5/13/1997, Delivery System for Controlled Release of Bioactive Factors.

Glowacki et al.; #5,656,492; 8/12/1997, Cell Induction Device.

Takagi, Watanabe, Takai, Kinouchi, Mizuno, Glowacki; #6,432,713 B2. 8/13/02 Method and Apparatus for Cultivating a Cell or Tissue.

Mizuno, Glowacki, Watanabe, Takai, Kinouchi, Takagi; # US 6,599,734 B2 7/29/03; Culture System and Methods for Engineered Tissue.

Mizuno, Glowacki, Watanabe, Takai, Kinouchi, Takagi; # US 6,607,917 B2 8/19/03 Method and Apparatus for Cultivating a Cell or Tissue.

Yates, Mizuno, and Glowacki; #B0801/7181 (ERP/KA); Filed 3/12/2001; Diagnosis and Treatment of Skeletal Degeneration Conditions

### Abstracts Since 1990

1. Pettis G, Kaban LB, Glowacki J. Long-term osseous response to composite ceramic/demineralized bone implants. Amer Assoc Dent Research, 1990. J Dent Res 1990;69:834.
2. Bleiberg I, Glowacki J, Anklesaria P, Greenberger JS. Development of an osteoclastic environment in implants of bone particles in mice. Int Soc Exp Hematol, 1990.
3. Glowacki J, Libert E, Pettis, G. The influence of inflammation on osteogenesis induced by demineralized bone particles. Third International Workshop on Cells and Cytokines in Bone and Cartilage, Davos, Switzerland, April 8-11, 1990. Calcif Tissue Int 1990;46:A5.
4. Glowacki J, Libert E, Liggett W, Sohoni S. Two methods to quantitate tartrate-resistant acid phosphatase activity. Third International Workshop on Cells and Cytokines in Bone and Cartilage. Davos, Switzerland, April 8-11, 1990. Calcif Tissue Int 1990;46:A4.
5. Glowacki J, Seo-Kurokawa M, Klagsbrun M. Neutralizing antibodies against bFGF inhibit osteogenesis induced by demineralized bone powder. Third International Workshop on Cells and Cytokines in Bone and Cartilage, Davos, Switzerland, April 8-11, 1990. Calcif Tissue Int 1990;46:A5.
6. Liggett W, Lian JB, Anklesaria P, Greenberger JS, Glowacki J. Effects of osteocalcin on proliferation and differentiation of putative osteoclast progenitors from murine long-term bone marrow cultures. Amer Soc Bone Mineral Res, Atlanta, GA, August, 1990. J Bone Min Res 1990;5:S78.
7. Glowacki J, Sledge CB. Tissue responses to bone-derived and polymeric materials. Soc Int Recherche Orthoped Traumatol, Montreal, September, 1990.
8. Bleiberg I, Glowacki J, Anklesaria P, Greenberger JS. Delayed osteoclast activity at the site of bone particle implants in complete radiation chimeras reconstituted with mi/mi osteopetrotic spleen hematopoietic cells. Am Soc Hematol, 1990. Blood 1990;76:85A.
9. Shevde N, Ferraro N, Glowacki, J. Giant cell lesions of the jaw: osteoclastic properties. Int Assoc Dental Res, Acapulco, April, 1991. J Dent Res 1991;70:373.
10. Zelicof S, Sledge CB, Glowacki J. The effects of particulate materials on spontaneous bone healing in a rat tibial defect model. Orthop Res Soc, March, 1991. Orthopedic Trans 1991;15:585.
11. Glowacki J, Marcus S, Quinto C. Differential cellular attachment to bone replacement materials. Scanning Microsc. Mtg., Bethesda, MD, May, 1991.

12. Bleiberg I, Greenberger JS, Glowacki J. Osteoclastogenesis in subcutaneous implants of bone matrix in normal, mutant, and chimeric mice. Amer Soc Bone Min Res, San Diego, August, 1991, J Bone Min Res 1991;6:S93.
13. Perona B, LeGeros R, Sledge CB, and Glowacki J. Differences in osteocompatibility of resorbable or non-resorbable calcium phosphates in rat tibial wounds. Amer Soc Bone Min Res, San Diego, August, 1991, J Bone Min Res 1991;6:S206.
14. Mizuno S, Lycette C, Quinto C, Glowacki J. A collagen/DBP sponge system for *in vitro* analysis of chondroinduction. Materials Res Soc, Boston, Dececeember, 1991.
15. Mizuno S, Lycette C, Quinto C, Glowacki J. *In vitro* analysis of chondroinduction. Amer Soc Cell Biol, Boston, December, 1991. J Cell Biol 1991;115:447a.
16. Perona BP, LeGeros R, Sledge CB, Glowacki J. The effect of crystallinity on the osteocompatibility of calcium phosphates implanted in rat tibial wounds. Orthop Res Soc, Washington, February, 1992. Orthopedic Trans 1992;16(2):412.
17. Shevde N, Glowacki J. Effects of interleukin 6 on proliferation and differentiation of osteoclast progenitors. AADR, Boston, March, 1992. J Dental Res 1992;71:353.
18. Shevde N, Greenberger JS, Quinto C, Bleiberg I, Glowacki J. Evidence for direct or stromal cell-mediated stimulation of osteoclastogenesis. Int Soc Exp Hematol, Providence, RI, July, 1992. Exp Hematol 1992;20:810.
19. Glowacki J, Kaufman L. The development of fish hyperostosis and modulation with testosterone. Int Conf Calcium-Regulating Hormones, Florence, Italy, April, 1992.
20. Glowacki J, Lycette C. Models to investigate anti-osteogenic and anti-resorptive effects of bisphosphonates. Am Soc Bone Min Research, Minneapolis, September, 1992. J Bone Min Res 1992;7:S316.
21. Shevde N, Anklesaria P, Greenberger JS, Glowacki J. Mechanisms of regulation of osteoclastogenesis in defined murine marrow cultures. Am Soc Bone Min Research, Minneapolis, September, 1992. J Bone Min Res 1992;7:S107.
22. Glowacki J, Girasole, G, Lycette C, Kilander K, Manolagas S. Osteoclast precursors and interleukin-6 production by human bone marrow: modulation by estrogen and age. Am Soc Bone Min Research, Minneapolis, September, 1992. J Bone Min Res 1992;7:S316.
23. Mizuno S, Glowacki J. Chondrocytic properties of human dermal fibroblasts cultured in composite demineralized bone/collagen matrices. Orthop Res Soc, San Francisco, February, 1993. Orthopedic Trans 1993;17(3):702-703.
24. Glowacki J, Shevde N, Greenberger JS. Distinct roles of Interleukin -1, -6, and -11 in osteoclastic differentiation of hematopoietic progenitors. Am Soc Bone Min Res, Tampa, September, 1993. J Bone Min Res 1993;8:S164.
25. Glowacki J, Connolly M, Yeh J, Sledge CB, Goldring SR, Girasole G, Jilka R, Manolagas S. Bone marrow biology in osteoarthritis and rheumatoid arthritis. Orthop Res Soc, New Orleans, February, 1994. Orthopedic Trans 1994-1995;18(4):406.
26. Azar H, Shevde N, Reichel H, Greenberger JS, Glowacki J. Regulation of murine osteoclast progenitors: the roles of IL-6 and IL-6 receptors. Am Soc Bone Min Res, 1994. J Bone Min Res 1994;9:S245.



27. Gerstenfeld L, Uporova T, Huang L-F, Schmidt J, Strauss PG, Mizuno S, Glowacki J. Regulation of osteogenesis and gene expression: differences revealed by *in vitro* and *in vivo* studies with clonal osteosarcoma cells. Orthop Res Soc, Orlando FL, February, 1995. Ortho. Trans 1995;19:1091.
28. Rosen CJ, Verault D, Glowacki J. Age, hormone, and cytokine-dependence of the skeletal IGF regulatory system in human marrow. Orthop Res Soc, Orlando FL, February, 1995. Ortho Trans 1995;19:1085.
29. Mizuno S, Glowacki J. A 3-dimensional culture system for *in vitro* analysis of chondroinduction of human dermal fibroblasts. Soc Biomat, San Francisco, CA, March, 1995.
30. Yeh J, Kohlmeier L, LeBoff MS, Connolly M, Glowacki J. Expression of aromatase P450 in marrow from men and postmenopausal women. Endocrine Soc, Washington, DC, June, 1995.
31. Rosen CJ, Steffens C, LeBoff M, Glowacki J. Effects of age on the skeletal IGF regulatory system. Endocrine Soc, Washington, DC, June, 1995.
32. Cheleuitte D, Mizuno S, Reichel H, Glowacki J. Effects of interleukins on cytokine productions by marrow cultured from postmenopausal women. Am Soc Bone Min Res, Baltimore, MD, September, 1995. J Bone Min Res 1995;10:S442.
33. Rosen CJ, Verault D, Steffens C, Glowacki J. Effects of age, parathyroid hormone, interleukin-1, and estrogen on the skeletal IGF regulatory system. Am Soc Bone Min Res, Baltimore, MD, September, 1995. J Bone Min Res 1995;10:S349.
34. Mizuno S, Glowacki J. Quantitative evaluation of chondroinduction in human dermal fibroblasts. Am Soc Bone Min Res, Baltimore, MD, September, 1995. J Bone Min Res 1995;10:S337.
35. LeBoff MS, Rosen C, Rightmire F, Glowacki J. Changes in growth factors and cytokines in postmenopausal women. Am Soc Bone Min Res, Baltimore, MD, September, 1995. J Bone Min Res 1995;10:S345.
36. Grimanis GA, Guo J, Lanske B, Reinhart AL, Reichel H, Glowacki J, Bringham FR. The parathyroid hormone responsiveness of bone marrow stromal cells. Am Soc Bone Min Res, Baltimore, MD, September, 1995. J Bone Min Res 1995;10:S481.
37. Gerstenfeld L, Uporova T, Huang L-F, Schmidt J, Strauss PG, Gundberg C, Mizuno S, Glowacki J. Osteogenic potential of osteosarcoma cells as revealed by differences in *in vivo* / *in vitro* gene expression. Am Soc Bone Min Res, Baltimore, MD, September, 1995. J Bone Min Res 1995;10:S433.
38. Kohlmeier L, Glowacki J, Franklin J, Sledge CB, Wright J, Angell J, Tang G, LeBoff MS. Low vitamin D and high parathyroid hormone in women with acute hip fracture. Endocrine Society, 1996.
39. Lackey M, Kaban LB, Marchena J, Glowacki J. Development of cranial bone and sutures in fetal rabbits. AAOMS, September, 1996.
40. Kohlmeier LA, Franklin J, Angell J, Glowacki J, LeBoff MS. Body composition and bone mineral density in postmenopausal women with acute hip fractures. J Bone Min Res, 1996.
41. Kohlmeier LA, Tang G, Adler GK, Franklin J, Glowacki J, LeBoff MS. Circulating interleukin-6 levels in postmenopausal women with acute hip fractures. J Bone Min Res 1996;11:S408.

42. Noordin S, Cheleuitte D, Mishra N, Bleiberg I, Glowacki J. Effects of parathyroid hormone, 1,25-dihydroxyvitamin-D, and interleukin-1 on the secretion of interleukin-6 and -11 by human bone marrow. *J Bone Min Res* 1996;11:S416.
43. Mizuno S, Glowacki J. Effects of interleukin-1 $\alpha$  and TGF- $\beta$  on chondroinduction of human dermal fibroblasts and phenotypic maintenance of bovine chondrocytes in a 3-dimensional culture device. *J Bone Min Res* 1996;11:S299.
44. Shih SD, Gerstenfeld LC, Mizuno S, Schmidt J, Strauss PG, Glowacki J. Variable bone-specific gene expression in clonal murine osteosarcoma cell lines. *J Bone Min Res* 1996;11:S408.
45. Mizuno S, Wang J, Greenberger JS, Glowacki J. Perfusion enhances functions of bone marrow stromal cells in three-dimensional culture. The 38th Annual Meeting of ASH, Orlando, FL, December 6-10, 1996.
46. Glowacki J, Greenberger JS, Rajavashisth TB. Extramedullary hematopoiesis in calcified aortas of APO E knockout mice. The 38th Annual Meeting of ASH, Orlando, FL, December 6-10, 1996.
47. Greenberger, JS, Bray JA, Glowacki J, Epperly MW. OP/OP bone marrow stromal cells expressing transgenes for cell surface M-CSF protein can support osteoclastogenesis. The 38th Annual Meeting of ASH, Orlando, FL, December 6-10, 1996.
48. LeBoff MS, Kohlmeier L, Franklin J, Haden S, Hurwitz S, Wright J, Glowacki J. Compared with osteoporotic controls acute hip fracture patients show high PTH and low vitamin D levels. 79th Annual Meeting of The Endocrine Society, January, 1997.
49. Mizuno S, Tateishi T, Ushida T, Ohshima N, Sledge CB, Glowacki J. Effects of soluble, insoluble, and mechanical factors on bovine chondrocytes in 3-dimensional culture. 43rd Annual Meeting, Orthopedic Research Society, San Francisco, CA, February 9-13, 1997.
50. Gerstenfeld LC, Shih SD, Mizuno S, Gundberg C, Glowacki J. Heterogeneity of osteosarcoma cells can be defined by differences in regulation of gene expression *in vitro* and *in vivo*. 43rd Annual Meeting, Orthopedic Research Society, San Francisco, CA, February 9-13, 1997.
51. Lackey M, Kaban LB, Glowacki J. Regeneration of fetal rabbit osseous wounds. IADR, Orlando, March 22, 1997. *J Dent Res* 1997;76:2909.
52. Glowacki J, Cheleuitte D, Mizuno S, Yeh J, Girasole G, Rosen C. Potential roles of bone marrow stroma in human skeletal metabolism. IV Workshop on Osteobiology, Salsomaggiore, Italy, June 20-23, 1997.
53. Gerstenfeld LC, Shea C, Shih SD, Mizuno S, Gundberg C, Glowacki J. In vitro/In vivo variation of osteogenic gene expression and 1,25-dihydroxyvitamin D3 response in different murine osteosarcomas. ASBMR; Cincinnati, OH, September, 1997. *J Bone Min Res* 1997;12:F414.
54. Glowacki J, Yates K, Lesieur-Brooks A, Bleiberg I, Cheleuitte D. Confounding influences of culture conditions on cytokine secretion by cultured primary human bone marrow cells. ASBMR; Cincinnati, OH, September, 1997. *J Bone Min Res* 1997;12:S337.
55. Gerstenfeld LC, Simkina I, Shih S, Mizuno S, Glowacki J. Genetically engineered murine osteosarcoma cells that constitutively express bone sialoprotein (BSP) show increased ECM mineralization and altered ECM gene expression. ASBMR, Cincinnati, OH, September, 1997. *J Bone Min Res* 1997;12:S294.

56. Gerstenfeld LC, Simkina I, Shih S, Mizuno S, Glowacki J. Genetically engineered murine osteosarcoma cells that over express bone sialoprotein or osteocalcin show altered cell growth and ECM gene expression in response to the transgene. Orthopedic Research Society, New Orleans, LA, March, 1998.
57. Shea CM, Gerstenfeld LC, Shih SD, Mizuno S, Gundberg C, Glowacki J. In vitro/In vivo variation of osteogenic gene expression and 1,25-dihydroxyvitamin D3 response in different murine osteosarcomas. Am Assoc Dental Res, Minneapolis, MN, March 4-7, 1998, J Dent Res 1998;77:248.
58. Troulis MJ, Seldin EB, Glowacki J, Perrott DH, Gordon J, Greaves K, Kaban LB. Endoscopic approach to the mandible for distraction osteogenesis. Amer Cleft Palate/Craniofacial Association, Baltimore, MD, April 20-25, 1998.
59. Halpern JH, Mendelson JH, Glowacki J, Sholar MB, Lesieur-Brooks A, Siegel AJ, Pesok AL. Diminished cytokine IL-6 response in men and women after IV cocaine administration. NIDA College on Problems in Drug Dependence, 1998.
60. Mueller SM, Mizuno S, Gerstenfeld LC, Glowacki J. Perfusion of media enhances bone formation by murine osteosarcoma cells cultured in collagen sponges: a new three-dimensional model. Combined ORS Meeting, Japan, 1998.
61. Haden ST, Hurwitz S, Glowacki J, Rosen CJ, LeBoff MS. Effects of age on serum dehydroepiandrosterone, IGF-I, and IL-6 levels. ASBMR, San Francisco, CA, December, 1998. Bone 1998;23:S620.
62. Makhlef HA, Mueller S, Mizuno S, Glowacki J. Osteoclastic differentiation of human bone marrow cells cultured in three-dimensional collagen sponges. ASBMR, San Francisco, CA, December, 1998. Bone 1998;23:S430.
63. Mueller SM, Mizuno S, Glowacki J. The effect of age on the osteogenic potential of human bone marrow cells cultured in three dimensional collagen sponges. ASBMR, San Francisco, CA, December, 1998. Bone 1998; 23:S536.
64. Mueller SM, Mizuno S, Gerstenfeld LC, Glowacki J. Osteogenesis by murine osteosarcoma cells cultured in collagen sponges. ASBMR, San Francisco, CA, December, 1998. Bone 1998; 23:S208.
65. Eid K, Mizuno S, Glowacki J. Effect of PTH on matrix production by articular and endochondral chondrocytes in 3D collagen sponges. ASBMR, San Francisco, CA, December, 1998. Bone 1998; 23:S349.
66. Yates KE, Mizuno S, Glowacki J. A three-dimensional system for induced chondroblast differentiation. ASBMR, San Francisco, CA, December, 1998. Bone 1998; 23:S343.
67. Yates KE, Mizuno S, Glowacki J. Molecular evidence for chondrogenesis and chondroinduction in three-dimensional collagen sponges. Orthopedic Research Society, February 1-4, 1999, Anaheim, CA.
68. Kim S, Caruso EM, Peretti GM, Goldring MB, Schomaker KT, Glowacki J, Zaleske D. Enzymatic pre-treatment of devitalized chick embryonic cartilage matrix for enhancement of seeding/penetration with xenogeneic chondrocytes. Orthopedic Research Society, February 1-4, 1999, Anaheim, CA.

69. Mueller SM, Mizuno S, Gerstenfeld LC, Glowacki J. Continuous media perfusion increases bone formation in a three-dimensional model *in vitro*. Orthopedic Research Society, February 1-4, 1999, Anaheim, CA.
70. Mizuno S, Ushida T, Tateishi T, Glowacki J. Effects of hydrostatic pressure on chondrogenesis by bovine articular chondrocytes in three-dimensional culture. Orthopedic Research Society, February 1-4, 1999, Anaheim, CA.
71. Yates KE, Kaban LB, Glowacki J. Gene expression during distraction osteogenesis of the porcine mandible. March 10-13, 1999, Vancouver, Canada. J Dent Res 1999; 78.
72. Glowacki J, Shusterman M, Troulis M, Holmes R, Perrott D, Kaban LB. Distraction osteogenesis of the porcine mandible: Histomorphometric evaluation. Amer Assoc Oral Maxillofacial Surg, September 29-October 2, 1999, Boston, MA. J Oral Maxillofacial Surg 1999; 57S: 31-32.
73. Castaño FJ, Troulis MJ, Glowacki J, Kaban LB, Yates KE. Proliferation of masseter myocytes after distraction osteogenesis of the porcine mandible. Amer Assoc Oral Maxillofacial Surg, September 29 - October 2, 1999, Boston, MA. J Oral Maxillofacial Surg 1999; 57S: 32.
74. Mueller SM, LeBoff M, Greenberger JS, Bleiberg I and Glowacki J. Effects of age on stimulation of osteoblastogenesis by 1,25 dihydroxyvitamin D3 in human bone marrow. Amer Soc Bone & Mineral Research, September 30 - October 4, 1999, St. Louis, MO. J Bone Min Res 1999; 14: S307.
75. Gordon C, Makhlef H, Blahut E, LeBoff MS, Glowacki J. Gonadal and adrenal steroids inhibit IL-6 secretion by human marrow cells. Amer Soc Bone & Mineral Research, September 30 - October 4, 1999, St. Louis, MO. J Bone Min Res 1999; 14: S268.
76. Mueller SM, Glowacki J. The effect of age on the osteogenic potential of human bone marrow stromal cells. Amer Soc Bone & Mineral Research, September 30 - October 4, 1999, St. Louis, MO. J Bone Min Res 1999; 14: S354.
77. Makhlef HA, Mueller SM, Mizuno S, Glowacki J. Age-related decline in osteoprotegerin expression by human bone marrow cells cultured in three-dimensional collagen sponges. Amer Soc Bone & Mineral Research, September 30 - October 4, 1999, St. Louis, MO. J Bone Min Res 1999; 14: S273.
78. Eid K, Glowacki J. In vitro chondrogenesis of human marrow stromal cells in novel 3-D collagen devices. Amer Soc Bone & Mineral Research, September 30 - October 4, 1999, St. Louis, MO. J Bone Min Res 1999; 14: S .
79. Delaney, M, Hurwitz, S, Glowacki J, Glass N, Rosen CJ, Mohan S and LeBoff MS. Insulin-like growth factors and markers of bone turnover in women with acute hip fracture versus women admitted for total joint replacement. Amer Soc Bone & Mineral Research, September 30 - October 4, 1999, St. Louis, MO. J Bone Min Res 1999; 14: S338.
80. Yates KE, Kaban LB, Glowacki J. Molecular evidence that TGF- $\beta$ , IGF-I, and BMP4 are expressed during distraction osteogenesis. Amer Soc Bone & Mineral Research, September 30 - October 4, 1999, St. Louis, MO. J Bone Min Res 1999; 14: S426.
81. LeBoff MS, Hurwitz S, Haden ST, Delaney M, Glass N, Glowacki J. Relationships among DHEAS, skeletal IGF-I, IL-6, and bone density in women. International Symposium on Endocrinology of Aging, October 27-30, 1999, Tempe, AZ

82. Glowacki J, Mueller SM, LeBoff M, Bleiberg I, Greenberger JS. Role of bone marrow in human skeletal aging. International Symposium on Endocrinology of Aging, October 27-30, 1999, Tempe, AZ
83. Yates KE, Mizuno S, Glowacki J. Differential gene expression in human dermal fibroblasts chondroinduced by demineralized bone. Orthopedic Research Society, March 2000 Orlando, FL.
84. Mizuno S, Ushida T, Tateishi T, Minas T, Glowacki J. Hydrostatic pressure stimulates extracellular matrix accumulation and synthesis by bovine and rabbit chondrocytes in three-dimensional culture. Orthopedic Research Society, March 2000 Orlando, FL.
85. Glowacki J. Engineered cartilage, bone, and joints. TMJ Association Scientific Workshop, May 2000, Bethesda, MD.
86. Mueller SM, LeBoff M, Greenberger JS, Bleiberg I, Glowacki J. Age-related decline in 1,25 dihydroxyvitamin D's stimulation of osteoblast differentiation in human marrow. Endocrine Society, June 2000, Toronto
87. Gordon C, Makhlef H, Blahut E, LeBoff MS, Glowacki J. Adrenal androgens and gonadal steroids inhibit IL-6 secretion by human marrow cells. Endocrine Society, June 2000, Toronto
88. August M and Glowacki J. The influence of age and estrogen status on implant osseointegration rates. American Assoc Oral Maxillofacial Surg, Sept, 2000.
89. Allemann F, Yates KE, and Glowacki J. Preservation of chondroblastic gene expression signature in 3D culture devices. Am Soc Bone Mineral Res, Sept, 2000, Toronto. J Bone Mineral Res 2000; 15:S468.
90. Yates KE, Mizuno S, Glowacki J. Representational difference analysis of chondroinduced human dermal fibroblasts reveals upregulated cellular and cytoskeletal components. Am Soc Bone Mineral Res, Sept, 2000, Toronto. J Bone Mineral Res 2000; 15:S341.
91. Mizuno S and Glowacki J. Effects of 2% and 19% oxygen on matrix production by bovine articular chondrocytes in 3d culture. Am Soc Bone Mineral Res, Sept, 2000, Toronto. J Bone Mineral Res 2000; 15: S467.
92. Rubin DA, Eid K, Yates KE, Mizuno S, and Glowacki J. Induction of IGF-I expression in human dermal fibroblasts grown in a 3-dimensional collagen sponge. Am Soc Bone Mineral Res, Sept, 2000, Toronto. J Bone Mineral Res 2000; 15: S367.
93. Gordon CM, LeBoff, Glowacki J. Differential effects of adrenal and gonadal steroids on IL-6 secretion by marrow from postmenopausal women. Am Soc Bone Mineral Res, Sept, 2000, Toronto. J Bone Mineral Res 2000; 15: S311.
94. Glass NA, Tang G, Glowacki J, Hurwitz S, LeBoff MS. Circulating interleukin-6 and N-telopeptide levels in postmenopausal women with acute hip fracture. Am Soc Bone Mineral Res, Sept, 2000, Toronto. J Bone Mineral Res. 2000; 15: S461.
95. LeBoff MS, Hurwitz S, Glowacki J. Occult osteoporosis and vitamin D deficiency among postmenopausal osteoarthritic women undergoing total hip arthroplasty. Oral Presentation; 4th Int Symp on Women's Health and Menopause. Washington DC, May 19-23, 2001.
96. Glowacki J, Zaleske D. Engineering a biological joint. BECON 2001, Washington, DC, June 25-26, 2001

97. Perrott D, Rahn B, Wahl D, Linke B, Thurmüller P, Troulis M, Glowacki J, Kaban L. Development of a mechanical testing system for a porcine distraction osteogenesis model. AAOMS, Orlando, Sept 12-15, 2001.
98. Simon J, Mascarenas A, LeBoff M, Glowacki J. DHEA stimulates osteoblast differentiation in human marrow cultures. Am Soc Bone Mineral Res, Oct, 2001, Phoenix. J Bone Mineral Res 16: S310, 2001.
99. Yates KE, Glowacki J. Identification and tissue-specific expression of connective tissue genes that are upregulated in postnatal chondroinduced human dermal fibroblasts. Am Soc Bone Mineral Res, Phoenix, Oct, 2001; J Bone Mineral Res 16: S238, 2001.
100. Glowacki J, Eid K, Thornhill TS. Chondrocyte gene expression in osteoarthritis. Am College Rheum, San Francisco, November 2001; Arthritis Rheum 44:S23, 2001.
101. Mizuno S, Glowacki J. Low oxygen concentration enhances chondroinduction in human dermal fibroblasts in vitro. Am College Rheum, San Francisco, November 2001; Arthritis Rheum 44:S43, 2001.
102. Yates KE, Glowacki J. Chondrocyte genes found by representational difference analysis to be upregulated in human dermal fibroblasts after short-term exposure to DBP. Am College Rheum, San Francisco, November 2001; Arthritis Rheum 44:S59, 2001.
103. Glowacki J, Yates KE, Warden S, Peretti G, Allemann F, Strongin D, MacLean R, Zaleske D. Engineered biological joints: In vitro and in vivo properties. Orthopedic Research Society, Dallas, Feb 2002.
104. Mizuno S, Solhphour S, Glowacki J, Minas T. Autologous cartilage repair in rabbits with chondrocytes in 3D collagen sponges precultured with hydrostatic pressure. Int Cart Repair Soc, June 2002, Toronto.
105. Schulten AJM, Kaban LB, Perrott D, Glowacki J. Effect of nicotine on distraction osteogenesis of the rat mandible. J Bone Min Res 17:S243, 2002. Am Soc Bone Mineral Res, Sept, 2002, San Antonio, TX.
106. Zhou S, Eid K, Glowacki J. TGF- $\beta$  stimulates chondrogenesis and inhibits adipogenesis of human marrow stromal cells in vitro: The role of Wnt-mediated Signaling via LRP5. J Bone Min Res 17:S432, 2002. Am Soc Bone Mineral Res, Sept, 2002, San Antonio, TX.
107. Mizuno S, Glowacki J. Effects of low oxygen on chondroinduction by human dermal fibroblasts induced by demineralized bone matrix. J Bone Min Res 17:S403, 2002. Am Soc Bone Mineral Res, Sept, 2002, San Antonio, TX.
108. Goff J, Shields DS, Greenberger JS, Glowacki J. Age-related differences in the capacity of human bone marrow STRO-1+ cells to differentiate to osteoblasts. American Society of Hematology, Dec, 2002, Philadelphia, PA.
109. Glowacki J, Zhou S, Yates KE. Comparison of TGF- $\beta$ /BMP pathways signaled by BMP-2 and demineralized bone powder in human dermal fibroblasts. Am Soc Bone Mineral Res, Sept, 2003, Minneapolis, MN.
110. Yates KE, Zhou S, Glowacki J. Genes that influence cell differentiation are altered by demineralized bone in vitro. Am Soc Bone Mineral Res, Sept, 2003, Minneapolis, MN.

111. Zhou S, Glowacki J. Inhibition of adipogenesis in human bone marrow stromal cells by hypoxia, TGF $\beta$ , and Wnt. Am Soc Bone Mineral Res, Sept, 2003, Minneapolis, MN.
112. Glowacki J, Wykóf CC, Mizuno S. Hypoxia-inducible factor-1 $\alpha$  and effects of hypoxia on chondrocytes and induced human chondrocytes. Am Soc Bone Mineral Res, Sept, 2003, Minneapolis, MN.
113. Siegel A, Mendelson J, Sholar M, Mello N, Halpern J, Lukas S, Kaufman M, Tofler G, Lewandrowski K, Glowacki J, Ridker P. Acute and chronic effects of cocaine on inflammatory and immune responses. 5th International Congress on Coronary Artery Disease, Oct 19-22, Florence, Italy.